


# Picture Window 8 Tutorial

Last Updated: 5-Jun-2025

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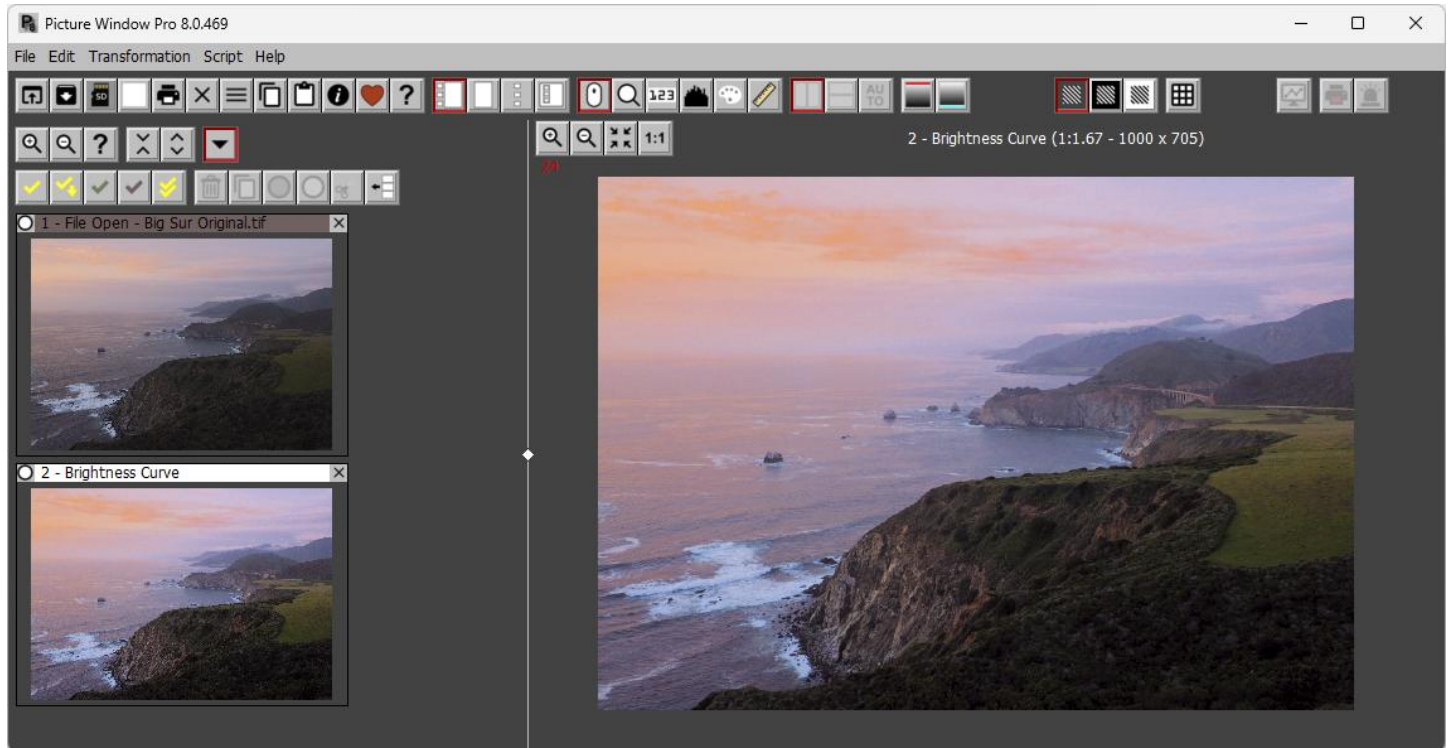
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# Introduction

The purpose of this document is to help you to quickly get started without getting bogged down in details. Investing time up front to understand the basics will make it easier to accumulate expertise later as you explore Picture Window in more depth.



## The Image Tree

Picture Window is built around the concept of an image tree, a branched structure that records operations as you perform them during an editing session. The image tree lets you modify or replay individual editing steps at will. Once you define a sequence of operations, you can apply them to other images as well.

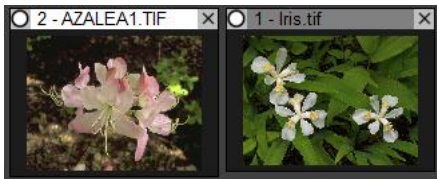
### The Image Browser

The image browser displays the image tree, with one thumbnail (miniature image) for each editing step, also called a transformation. The image browser normally appears on the left side of the screen, with a full-size version of the current image on the right, but you can also choose full-screen display of just the image browser or just the current image, or you can place the image browser in a separate window and drag it to a second monitor, if you have one.

### The Separator Bar

When they are displayed side by side, a moveable separator bar divides the image browser from the main image area. To adjust the separator, drag the white diamond at its center to the left or right.

## Opening New Files

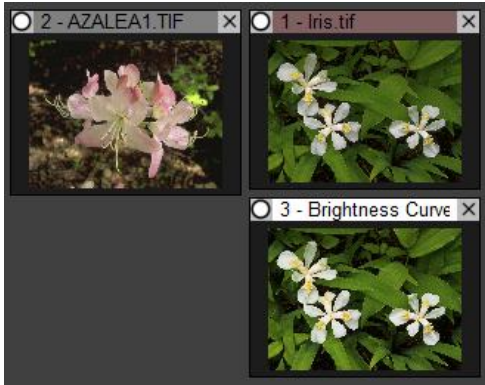


Use the File/Open command to open image files. Each file you open shows up as a new top-level image in the image tree.

## The Current Image

The current image is highlighted in the image browser with a white caption background. Clicking on a thumbnail makes its image current and displays a larger version in the main image area. This lets you quickly switch between images or select different parts of the image tree to work on.

## Adding to the Tree



Each new operation (called a transformation) you perform inserts a new image into the tree, usually just below the current image. By default, the thumbnail caption is the filename for File Open or the transformation name, but you can substitute your own captions if you want. Each thumbnail also has a unique number.

To change a caption, right click on the thumbnail and select Change Caption or Comment... from the popup menu. Comments are blocks of text you can associate with a transformation to document what it does.

## The Bypass Button

Clicking the small circle in the thumbnail caption turns the transformation on or off.




When the circle is white, the transformation is enabled. When the circle is gray, the input image passes through to the output image unchanged, effectively disabling the transformation. Each time you toggle the setting, all the images that depend on the current image are automatically updated.

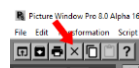
If you right-click the bypass button, it toggles the setting without making the image current. This lets you view a result image while changing the bypass setting of an image it depends on. This shows you what effect the transformation you are bypassing has on the final image.

## The Close Button

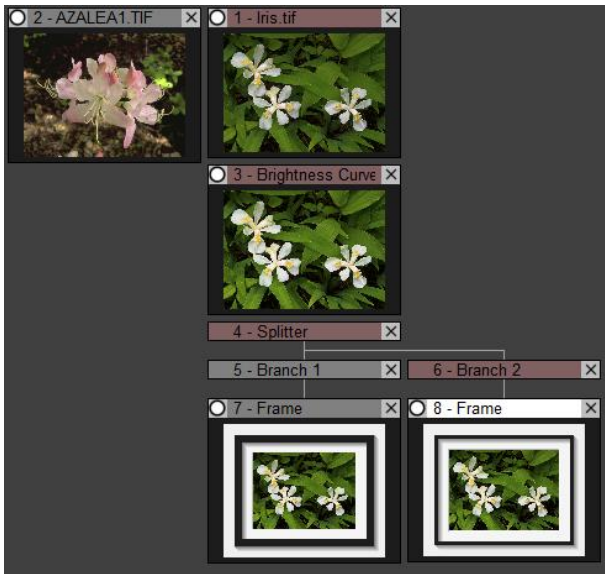


Clicking the X at the other end of the caption bar closes the image after displaying a confirmation message. You can also close the current image with the File/Close command.

To close all the images in the workspace, click the  button in the main tool bar.



## Side-Branches



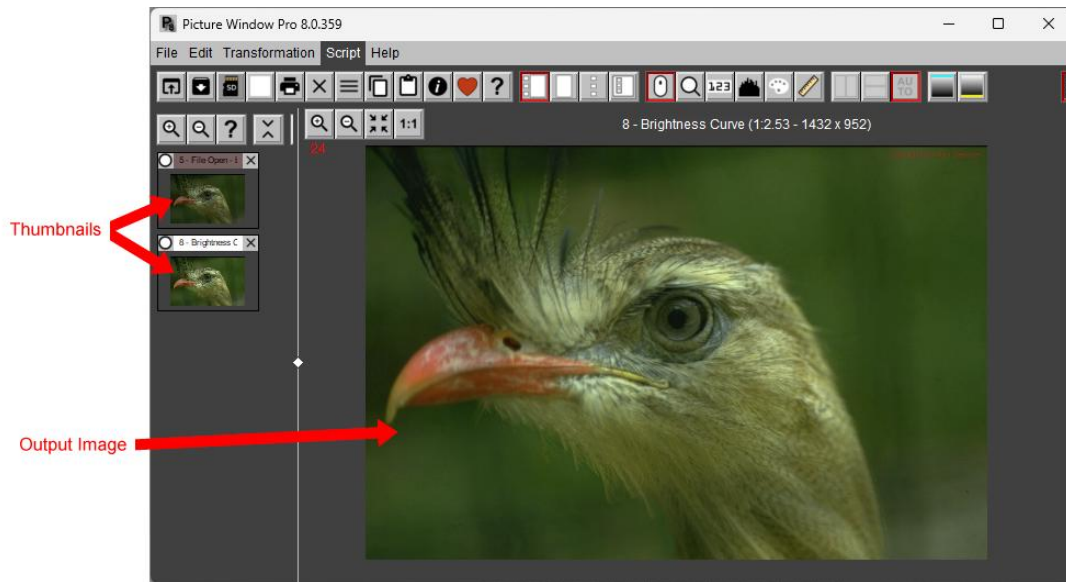
To explore different treatments of the same image, you can create side-branches and apply different operations to each one.

Side-branches are also useful when you need to apply two different operations to the same image and then combine them.

The easiest way to create a side-branch is to right click on a thumbnail and select Add Splitter After from the popup menu. The splitter acts as junction in the image tree below which you can insert one or more side branches. When you first create a splitter, it automatically creates a new side branch, but you can add more of them later if you need to.



# Thumbnails, Transformations and Images



## Thumbnails

Thumbnails are the small images displayed in the image browser. The current thumbnail is highlighted with a white caption background. The arrangement of thumbnails in the image tree reflects their relationships. In most cases, processing starts at the topmost image and proceeds down toward the bottom.

## Transformations

A transformation is simply an operation that produces an image. These operations are recorded in the image tree so you can recalculate them if one of their inputs changes or save and reload them later to continue editing where you left off.

Transformations are inserted into the image tree as a side effect of commands from the main menu. Most transformations are created via the Transformation submenu, but a few like File Open are created via the File submenu.

Every thumbnail has an associated transformation -- the name of the transformation is displayed in the caption of the thumbnail, but you can change the caption to something else if you wish. In the example above, the first transformation is File Open and the one below it is Brightness Curve. While the thumbnail and image are visible, the transformation and its settings are only displayed when you enter a new transformation or edit an existing one. You can also record multiline comments for each transformation to document its function.

## Images

Every transformation generates an output image, and a scaled version of the output image is displayed in the main image area when the thumbnail is selected. Images can be saved as image files, and this effectively takes a snapshot of their current state.

## Inputs and Outputs

Some transformations such as Brightness Curve operate on an input image which is the one whose thumbnail is just above it. They process this input image according to the settings of the transformation to produce an output image. In this example, Brightness Curve processes its input image (the output image of File Open) by adjusting its tonality according to a curve, and you can see the output image is noticeably lighter than the input image.

Other transformations such as File Open do not have an input image. These top-level transformations always appear at the head of a branch.



## **Transformation Dialog Boxes**

When you select a transformation from the main menu or double-click on a thumbnail to edit its transformation, a dialog box is displayed to let you adjust its settings. Since every transformation performs a different operation, each dialog box is different, although most of them share certain standard controls.

## **Transformations and Images Are Not the Same**

The same transformation with the same settings can produce an entirely different image depending on where it is placed in the image tree.

In this document, the terms thumbnail, transformation and image are sometimes used interchangeably. However, in certain contexts, such as rearranging the image tree, it is important to be aware of the difference.

# Opening and Saving Image Files

## Opening Files

To get started, you need an image to work on. There are several different ways to get images into Picture Window.

### File/Open

The most common way to open a file is with the File/Open command from the main menu. This brings up a standard Windows File Open dialog box you can use to navigate to the folder containing the file you want to open and then to select the file. Picture Window can open the following types of files:

- **TIFF** is Picture Window's preferred format since it supports 16-bit images, it is lossless, and it preserves all the camera and other metadata embedded in the file, such as aperture, shutter speed, ISO, etc.
- **JPEG** is a good choice if you want to compress your images for posting on the web or email. It also preserves metadata, but does not support 16-bit image data.
- **PNG** and **GIF** are also used for posting images on web sites, but they have limited metadata support.
- **BMP** is a Windows-specific format that does not support metadata.
- **HEIC/HEIF** is a new compressed format created to store images from smartphones. Picture Window can read but not write these files.
- **RAW** is proprietary format different for each camera. Picture Window can open many types of raw files directly. It uses the LibRaw.dll library to read raw files and this library is updated periodically to support new cameras. For a complete list of supported cameras, see <https://www.libraw.org/supported-cameras>.

Alternatively, you can use a separate raw converter program such as Lightroom, DxO PhotoLab, Capture One, or Raw Therapee. These programs let you open raw files, make a few preliminary adjustments, and then export the images as 16-bit TIFF files and send them to Picture Window. See the section in the help file on integrating Picture Window with other programs for details on how to make the export process as seamless as possible.

Once Picture Window opens the file you selected, it creates a new top-level image in the image browser and displays the image in the main image area.

If you have a folder where you store most of your image files, use the File/Set Default Folder command to tell Picture Window where the folder is located. Then you can use the File/Open from Default Folder command instead of File/Open and it will start up in your default folder. The File/Open command starts off in the last folder you opened a file from.

If you select multiple files, each one is opened in its own top-level image.

### Edit/Paste from Clipboard

You can paste images from the clipboard using the Edit/Paste Image from Clipboard command from the main menu. Like File/Open, this creates a new top-level image and displays it.

### Drag and Drop

You can drop one or more files onto the Picture Window icon in Windows Explorer to launch Picture Window and open the files.

Or, if Picture Window is already open, you can drop files into the main image area to open them. Each one opens in its own top-level image.

## **Saving Image Files**

To save the current image, use the File/Save As command from the main menu. This brings up a standard Windows File Save dialog box you can use to navigate to the folder you want to save the file in, and then to select the file name and the file type. Picture Window can save most of the same file types it can open.

Depending on the file type, further options are available. Using the File/Preferences dialog box, you can configure the default file save options for each file type.

To save the image to the same folder it was opened from, use the File/Save Back command instead of File/Save As. To save the image file in your default folder, use the File/Save to Default command.

You cannot use File/Save As to save a file with the same name as a file that is already open. If you did so, the image tree would become inconsistent since the original file would be lost and it would not make sense to apply its editing steps to a different image.

If you just want to open an image, make a few changes, and then save it back over the original without saving the intermediate transformations, you can use the File/Collapse command instead of File/Save As. See the help file for more information on how this works.

### **Saving with Scripts**

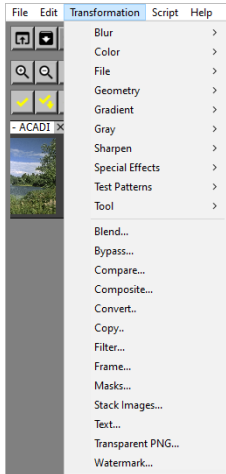
If you want to be able to re-edit the saved image file by reloading the original transformations that created it, set the File Save Options to Include Script with Image Names. This will save a script file along with the image file. The name of the script file is the name of the image file with “.script” appended. To re-load all the transformations that created the image file, open the script file instead of the image file. At this point, all the operations needed to recreate the file will be reloaded and you can then add, remove or edit any of the transformations. To open just the file, open the image file instead – this does not restore the transformations. More on script files later.

# Using Transformations

Transformations are the building blocks of the image tree. They generally operate on an input image and produce an output image, the input image being the one just above it in the image tree.

## Creating Transformations

You can create a new transformation and insert it into the image tree by selecting Transformation from the main menu and then selecting the transformation you want to create.



Transformations are grouped into sub-menus according to their function. A complete list of all the transformations along with a short description of what they do appears at the end of this document.

**Blur** – transformations that blur images in various ways such as Gaussian Blur or Motion Blur.

**Color** – transformations that operate on color images only such as Color Balance, Saturation, or Monochrome.

**File** – specialized transformations for use in batch operations.

**Geometry** – transformations that alter the size or shape of images such as Crop, Add Border, or Warp.

**Gradient** – transformations that produce or apply different kinds of gradients such as Linear, Oval, or Sweep.

**Gray** – transformations that operate on either black and white or color images such as Brightness Curve or Levels and Color.

**Sharpen** – transformations that sharpen images in various ways such as Unsharp Mask or Bilateral Sharpen.

**Special Effects** – transformations that apply various special effects to images such as Kaleidoscope, Posterize or Watercolor.

**Test Patterns** – transformations that create standard test patterns.

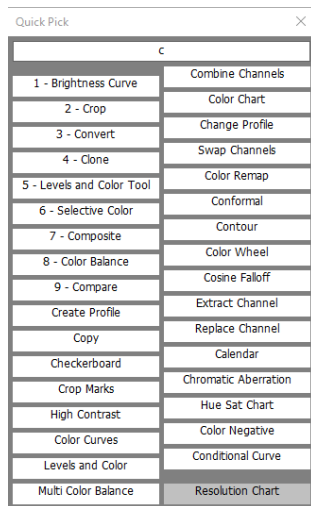
**Tool** – transformations that apply various freehand tools to images such as Clone, Paint, Smudge, Speck Removal or Scratch removal

**Miscellaneous** – transformations that do not fit into other categories or which are frequently used appear at the bottom of the Transformation menu.

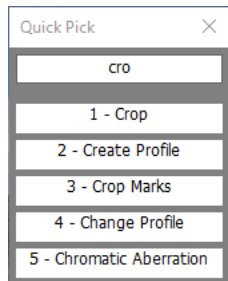
## Quick Pick

As an alternative to using the Transformation menu, you can use **Quick Pick** instead. The general idea is to press the space bar or type the first letter of the name of the transformation to display a list of transformations that contain a word that starts with that letter, listed with the ones you use the most often at the top of the list. You can select a transformation from the list by clicking on it or type additional letters to refine the search by limiting the list to transformations that start with the first letter and contain the second and succeeding letters somewhere in the name.

For example, to select the Crop transformation, start by typing C.




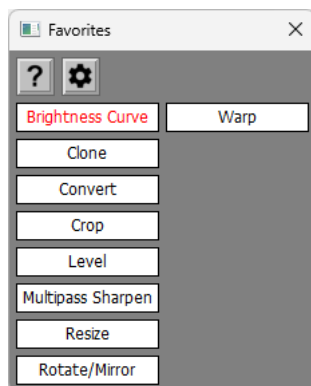
At this point, you can click on Crop or press 2 to select Crop. Or, you can type RO to get a much smaller list:



The list is now limited to transformations that contain a word that starts with C and also contain RO somewhere in the name. You can now press 1 to select Crop or click on the Crop button. If you type enough letters to uniquely identify the transformation, it is automatically selected.

## Favorites

Favorites are another way to select transformations you use frequently. When you type slash (/) or period (.) or click the  button on the main tool bar, a list of your current favorite transformations is displayed. You can add new Favorites to the list by right-clicking an image in the image browser and selecting Favorites from the popup menu.



To select a transformation, just click on it. To cancel, close the dialog box. To remove a transformation from the list, right click on it and select Remove Favorite from the context menu. To add a transformation to the list, right click on its thumbnail in the Image Browser and select Add to Favorites from the context menu.

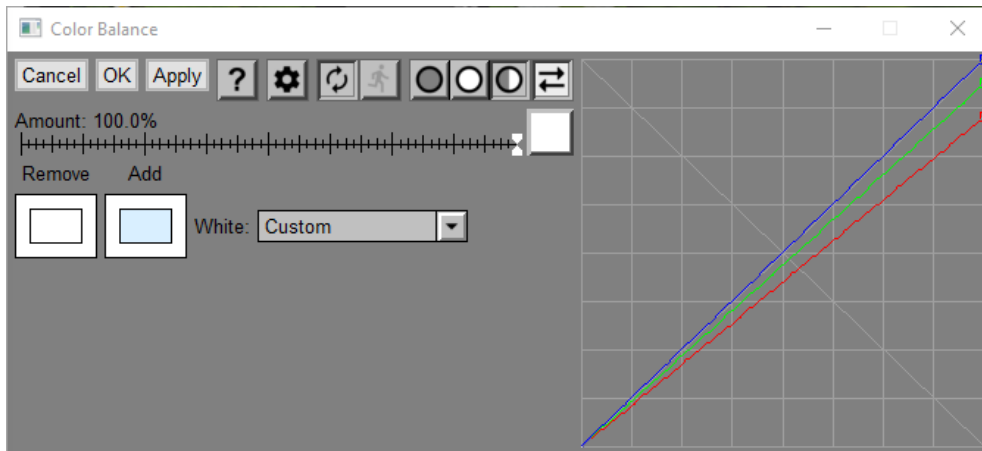
You can also access favorites as a list by right-clicking on a thumbnail in the image browser and selecting Favorites from the popup menu.

Normally, the Favorites window disappears as soon as you click on a transformation, but if you prefer, you can opt to keep it open (via the Settings menu). If you are using two monitors, for example, you can keep your Favorites open and tucked out of the way.

## Example – The Color Balance Transformation

First open a sample image. At this point, the image browser displays a small version of the image on the left and a full-size version on the right.

Next, select the Color Balance transformation (Transformation/Color/Color Balance from the main menu). This displays a second small image just below the first one in the image browser and brings up the Color Balance transformation dialog box.



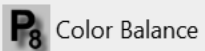
Color Balance Dialog Box

Every transformation has its own dialog box to let you adjust its settings. You can drag the dialog box to a new location or to a second monitor and, in most cases, you can also resize the dialog box by dragging one of its corners.

To temporarily hide the dialog box, click the minimize icon in the upper right corner.

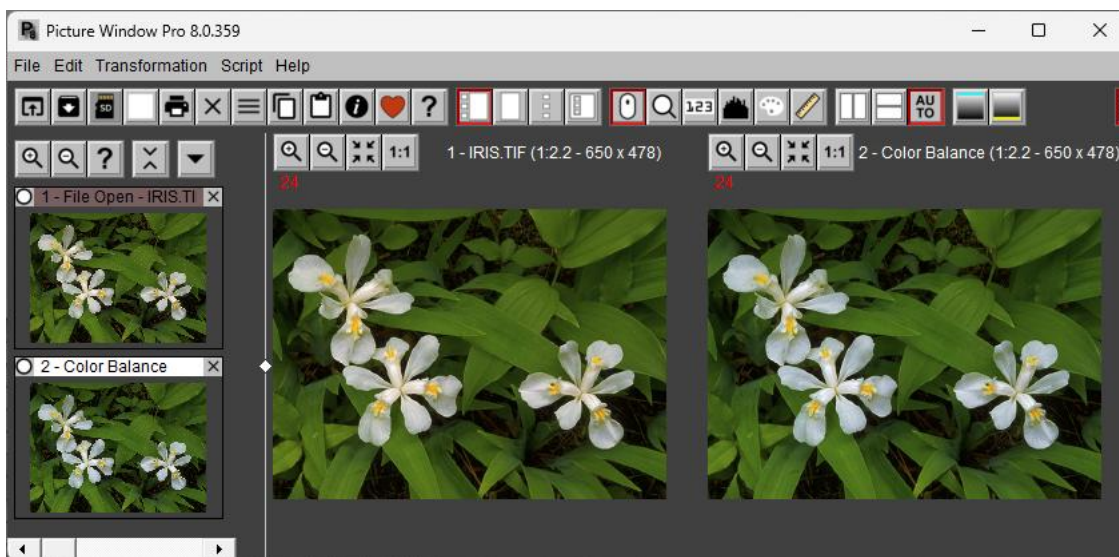


This reduces the dialog box to a labeled icon on the Windows task bar.



Click the task bar icon to get the dialog back.

The Color Balance transformation starts out in split screen mode, showing you the input image on the left and the output image on the right so you can see the effect the transformation is having as you change its settings.



The small number in the upper left corner of the image tells you what type of image it is:



1	binary (pure black and pure white only)
8	8-bit black and white (256 gray levels)
24	24-bit color (256 levels of red, green and blue)
16	16-bit black and white (65536 gray levels)
48	48-bit color (65536 levels of red, green and blue)

### Selecting the Input Image, the Output Image or Both

To see just the input or just the output image, use the tool bar at the top of the Color Balance dialog box:



The first button displays just the input, the second displays just the output and the third displays both side by side in a split screen display as illustrated above.

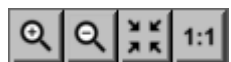
If you hold down the Alt key while clicking a button, the current zoom and scroll settings are preserved. Otherwise Picture Window does a zoom to fit when you turn side-by-side mode on or off.

### Synchronized Scrolling

If you select split screen display, you may also have the further option of turning synchronized scrolling on or off via the fourth button. When synchronized scrolling is enabled, zooming or scrolling the right half of the display does the same to the left half so the same part of the image is displayed on both sides. This option is only available for transformations that do not alter the size of the image.

### Zooming and Scrolling the Image

Zooming is controlled by the four-button tool bar just above the main image display:



From left to right, the buttons zoom in, zoom out, zoom to fit the entire image on the screen or zoom to 1:1 (one pixel of the image corresponds to one pixel on the screen).

Scroll bars are displayed if the image is too large to fit on the screen. As an alternative to scrolling via the scroll bars, you can also hold down the Alt button on the keyboard and click and drag the image to scroll it, or hold down the Alt button and use the arrow keys.

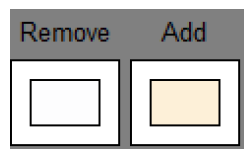
You can rotate the mouse scroll wheel to zoom the current image, keeping it centered to the extent possible on the cursor location.

### Getting Help



Anywhere you see this button, clicking it displays a relevant help topic from the help file.

### Using the Color Balance Dialog Box



Color Balance works with two different colors – a color to remove and a color to add. To set the color to remove, click on the left color patch – clicking the right color patch sets the color to add.

## The Color Picker

When you click on a color patch, a color picker is displayed.



Clicking anywhere in the large rainbow-colored area selects hue and saturation, while the slider on the right adjusts brightness.

For example, if your image is too green, select a green as the color to remove. The farther from the center you go, the more green is removed. You can zoom the color wheel in or out using the + or – buttons.

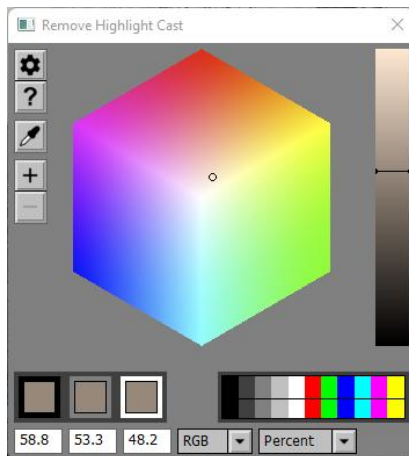
As a shortcut to selecting a color to remove, you can also click directly on the input image displayed on the left half of the split screen. If you click on a part of the input image you know is neutral, such as the whites of the eyes in a portrait a white wedding dress or a gray tree trunk, this will pick just the right color to remove any color cast.

Selecting a color to add applies a color to the image. For example, to warm up an image, first click on the color to add patch and then select a color in the red/orange/yellow area. Again, the farther from the center, the stronger the effect.

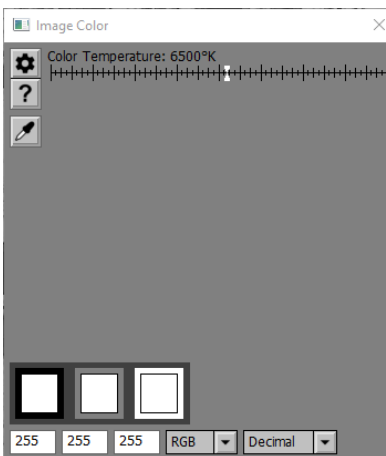


## Settings

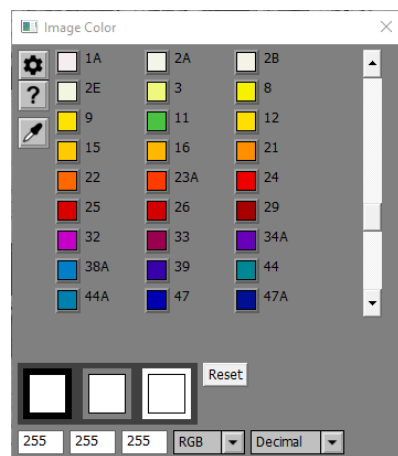
Clicking the settings button in any dialog box displays a settings menu which gives you access to additional options. For example, clicking this button in the color picker lets you switch to an alternate color selection method. There is also a Color Temperature selector and a Filter Bank that lets you select colors as any combination of standard Wratten or CC filters.



Color Wheel



Color Temperature



Filter Pack

## Auto White Balance

Color Balance has another control that lets you select automatic white balance if you wish. This works by averaging the lightest parts of the input image to guess what color should be white and setting the color cast to remove to that color. While it usually works well, it's not foolproof.

## The Amount Control

The Amount control, common to many transformations, lets you scale back the effect of Color Balance by blending a percentage of the output image with the input image.



At 100% you get the full effect; at 0% you get no effect; in between you get a partial effect. The solid color square to the right of the slider is for creating masks, a topic we will explore in the next section. It's called an Amount control because it determines what amount of the transformation will be applied.



## **Finishing Up**

When you are happy with the results, click OK (or press Enter) – or, to abandon your changes, click Cancel (or press Esc). Either one closes the transformation dialog box, leaving you ready proceed to the next step.

The Apply button is like OK, but it keeps the transformation dialog box open and propagates your changes to any other images that depend on the one you are editing. If you are working on the last image in a branch of the image tree as we are doing in this example, there is no compelling reason to use the Apply button.

Just so you know, there is also a more powerful version of the Color Balance transformation called Multi Color Balance that lets you apply different color corrections to the lighter or darker parts of the image.

# Scripts

A script is a text file that records all the operations you performed on an image. When you save an image, Picture Window gives you the option of saving a script file along with the image file. This gives you two ways to re-open an image:

- If you open the image file you get just the image.
- If you open the script file, Picture Window reloads all the transformations you used to create the image and rebuilds the saved image by re-opening any original files and re-applying all the transformations. You can then modify or add transformations to change the image and re-save the result.

When you edit an image and come back to it later, if you open the script file, you recover all the processing steps you used to create the image from your originals and you can resume editing from where you left off.

## Non-Destructive Editing

For scripts to work, you need to leave your original files unmodified so they can be reloaded by the script file – this is called non-destructive editing since the changes you make do not alter the original files.

### Working with Raw Files

For the following description, I am assuming you keep all your image files in a folder (for example My Pictures) and that you further organize related sets of image files (by date or by location or by subject) in subfolders. If you are working from Raw files, here is a recommended way to use Picture Window:

- 1) Copy the Raw files from your camera card to an existing or new image folder on your hard disk (see the File/Card to Folder command). Once the files have been copied successfully, format the card and replace it in your camera.
- 2) Use or a Raw converter (such as DxO Photolab, Capture One, Lightroom, Raw Therapee, or the software that came with your camera) to pre-process the raw files you want to work on, and save them as 16-bit TIFF files. The most important adjustments to make in the raw converter are:

Highlight and shadow recovery.

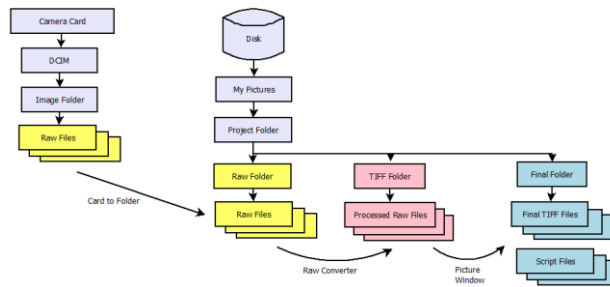
Noise reduction.

Lens distortion, chromatic aberration and light falloff corrections.

Store the converted images as 16-bit TIFF files in a separate sub folder (or in the same one as the Raw files) so you can process them in Picture Window. These files (along with the Raw files) are your originals – be careful not to modify or delete them as this will invalidate any script file that accesses them.

Alternatively, you can open Raw files directly in Picture Window but your processing options may be more limited than using a separate Raw converter.

- 3) Open a converted TIFF file in Picture Window and work on it until you get a result you like.
- 4) Save the edited image as a TIFF file, in a separate folder from your originals, and select the option to include a script with the saved image file. This will give you two files – a TIFF file and a script with the same name as the TIFF file but with “.script” tacked on the end.
- 5) To re-work an image, open its script file and make any changes you want to the processing workflow. At this point, you can either save the updated version with the same name as the previous version or, if you want to keep both versions, save it with a new version number.



## Working with JPEG or Other Files

If you are working from JPEG files or files not from a camera, the process is simpler:

- 1) Store your original files in a folder so you can process them in Picture Window – be careful not to modify or delete them as this will invalidate any script file that accesses them:
- 2) Open a file in Picture Window and work on it until you get a result you like.
- 3) Save the final image as a TIFF file, in a separate folder from your originals, and select the option to include a script with the saved image file. This will give you two files – a TIFF file and a script with the same name as the TIFF file but with “.script” tacked on the end.
- 4) To re-work an image, open its script file and make any changes you want to the processing workflow. At this point, you can either save the updated version with the same name as the previous version or, if you want to keep both versions, save it with a new version number.

## Workspace Scripts

Regular script files (with the “.script” extension) save only the operations necessary to rebuild the current image (the one being saved). For example, you may have created a workspace that includes processing an original image into several different versions. Or perhaps your workspace includes processing two different originals into two different result images. If you save one of the images with a script, you will only save the transformations necessary to produce that image.

Workspace scripts save everything in the entire workspace. To create a workspace script, use the Script/Save Workspace Script with Image Names command. To reload a workspace script, use the Script/Open Workspace Script command.

## For More on Scripts

There is a lot more you can do with scripts. For full information on scripts and workspace scripts, see the separate document Scripts.pdf.

# Using Masks to Make Local Corrections

By default, transformations apply their changes to the entire input image, but sometimes you just want to modify part of an image, and this is where masks come into play. Masks are created via an Amount control like the one in the Color Balance transformation in the previous section. Any transformation with an Amount control supports masks.

## What is a mask?

A mask is an 8- or 16-bit black and white image, exactly the same size as the input image.

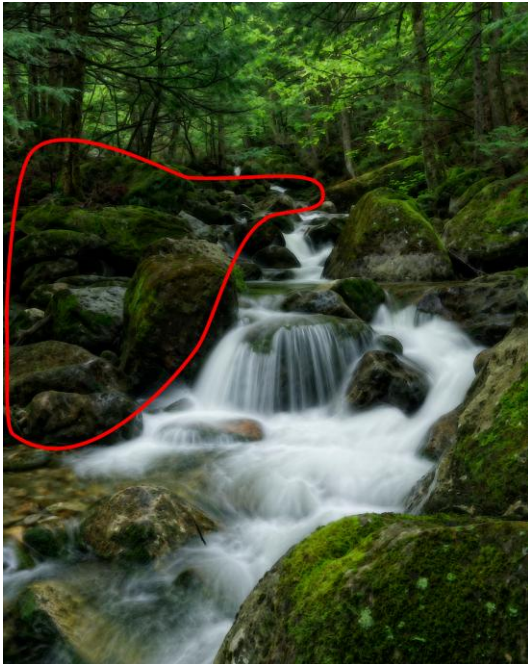
Where the mask is white, the transformation is applied full force; where the mask is black, the input image shows through unaffected. Where the mask is gray, you get a partial effect.

## Example – creating a simple mask.

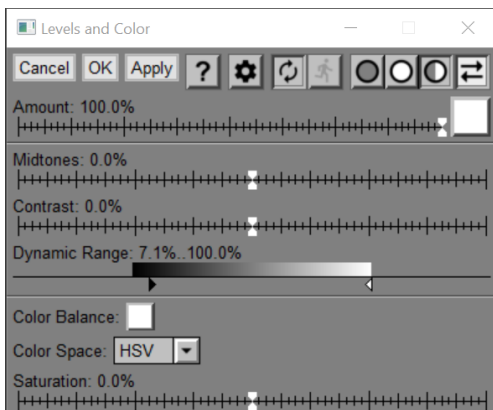
For this example, we introduce the Levels and Color transformation (Transformation/Gray/Levels and Color from the main menu). This is a sort of swiss army knife transformation that lets you adjust brightness and color using simple controls. There is also a more powerful version of the Levels and Color transformation called Adjust that can also sharpen and blur and which offers more comprehensive control over brightness and color.

## Plan the work...

In the sample image below, a dark area you may want to lighten to balance the composition is outlined in red:

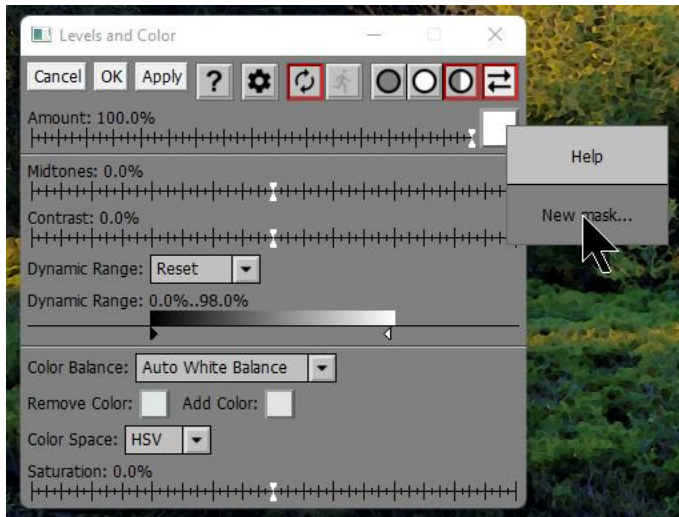


First, open the image file and select the Levels and Color transformation from the main menu. There are other, more advanced transformations you can use to lighten or darken images such as Adjust or Brightness Curve, but for now, let's keep it simple.



## Bringing up the Mask Dialog Box

To create a mask for this transformation, click on the white square at the right end of the Amount control, and select New mask... from the popup menu.



This brings up the Mask dialog box:



## Using the Freehand Mask Tool

Don't worry, for now we are only going to use a few of the many available masking tools. The leftmost masking tool is selected in the bottom tool bar. This tool lets you draw masks freehand on the input image (the image on the left side of the split screen). When you click and drag to draw a curve on the input image, it leaves behind an outline of the area that will be masked. When you release the mouse button, it connects the beginning of the curve to the end to create a closed region and then fills it with a semi-transparent red overlay to mark the area you selected.


The tool bars in the middle row let you select the mask mode, the mask overlay color and the mask overlay transparency. The mask mode determines what happens as you perform subsequent masking operations—it can add to the previous mask, subtract from the previous mask or remove any part of the masks that do not overlap. This lets you build up complicated masks one step at a time.

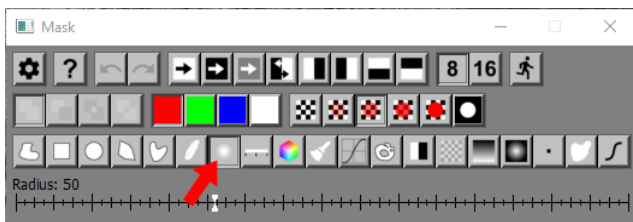
Here is the dark part of the image crudely selected as a mask. At this point, there is no need to select the region with great precision.



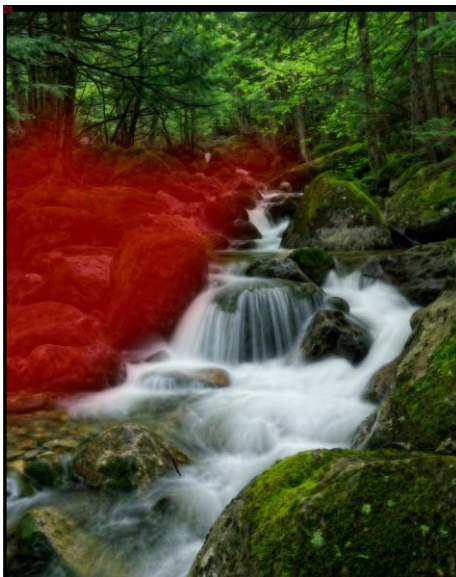
This creates a hard-edged mask—if you try to adjust the image using a mask like this, the boundary between masked and unmasked areas will stick out like a sore thumb.

## Using the Mask Blur Tool

To create a more natural effect, you need to soften the edges of the mask. A good way to do this is to select the mask blur tool in the mask dialog box. The greater the blur radius, the softer the edges of the mask. When you drag and release the Radius slider, the mask overlay is updated – once you get the effect you want, click the  button to finalize the mask.



Here is what the blurred mask looks like:



## The Mask Undo Button

The ideal blur radius for softening a mask depends on the image. With experience, you will get a feel for what values works best. If the blur is too much or too little, you can always click the mask Undo button and try again.



You could also use the mask feather tool to soften masks, but for this kind of mask, the blur tool produces a smoother effect.

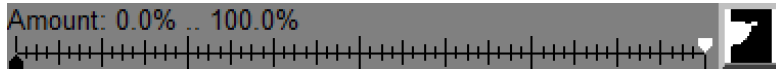
Also, as an alternative to using the Freehand mask tool followed by the Blur mask tool, you could paint the mask directly on the image with a soft brush using the Brush mask tool. However, because of the way overlapping brush strokes accumulate, it is difficult to paint a large area evenly with a consistently soft edge.

## Closing the Mask Dialog Box

We are done with the mask for now and ready to lighten the selected area, so you can now close the mask dialog box to get it out of the way. This also hides the red overlay so you can see the input image better. If you need to edit the mask later, click on the Amount control again and this time select Re-open Mask Dialog Box from the popup menu. This restores the mask you created and lets you pick up where you left off. To clear the mask, select Reset instead.

Once you create a mask, several things change.

- A half-size mask thumbnail is displayed in the image browser next to the current image
- A tiny version of the mask image is displayed in the square at the right end of the amount control
- The amount slider splits into two—a white slider and a black slider



The white slider controls how strongly the transformation will be applied where the mask is white.

The black slider controls how strongly it will be applied where the mask is black.

For example, by moving the white slider to the left, you can dial back the effect of the transformation where the mask is white. You can effectively invert the mask by reversing the positions of the white and black sliders.

## Lightening the Image

The easiest way to lighten the image with Levels and Color is to move the Midtones slider to the right.



When you drag the slider and release it, just the masked area is lightened, so feel free to experiment with different amounts of lightening. Changing any of the other Levels and Color settings, such as contrast or color saturation, will also affect just the area covered by the mask so you can change the color as well at the same time.

You can make very fine adjustments to sliders by holding down the Shift key while you drag the marker. This increases the resolution of the slider by a factor of 16.

## Checking the Result

A good way to see the effect of the transformation is to use the tool bar at the top of the transformation dialog box:



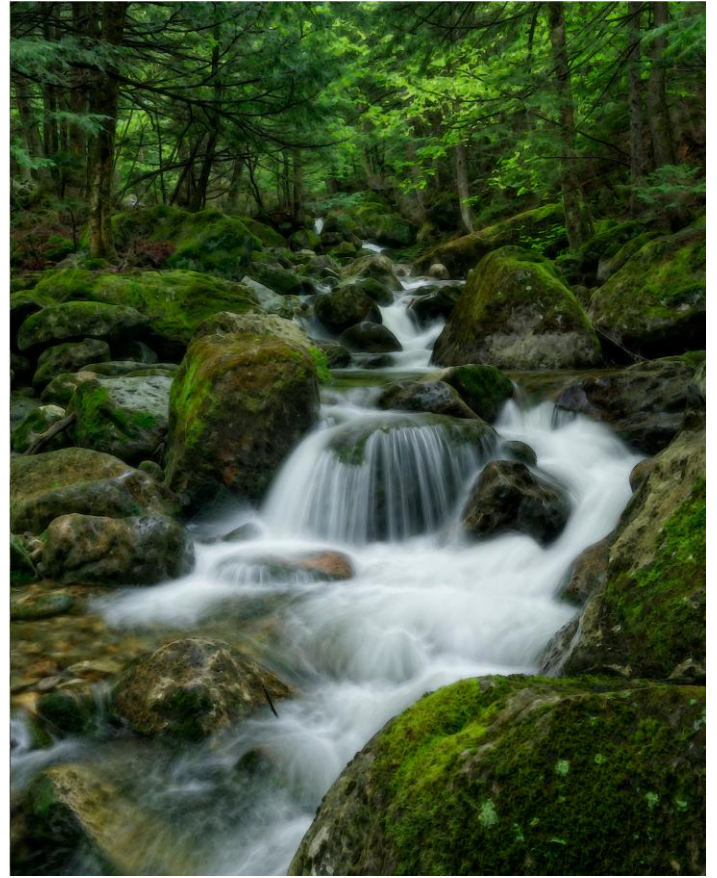
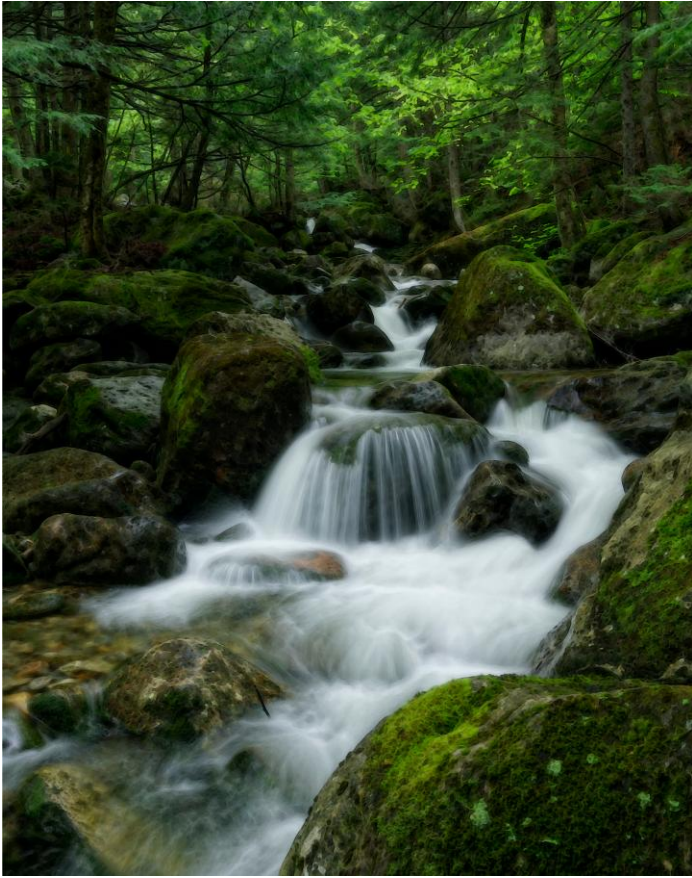
By alternately clicking the first two buttons, you can flip back and forth between the input image and the output image. This makes even subtle changes or problems stand out.

You can also use the Ctrl-D keyboard shortcut to toggle the display between the input and output images.

## Finishing Up

When you click OK, the Levels and Color dialog box is closed, the lightened image gets added to the image tree and you are done. Here are the before and after results side by side:





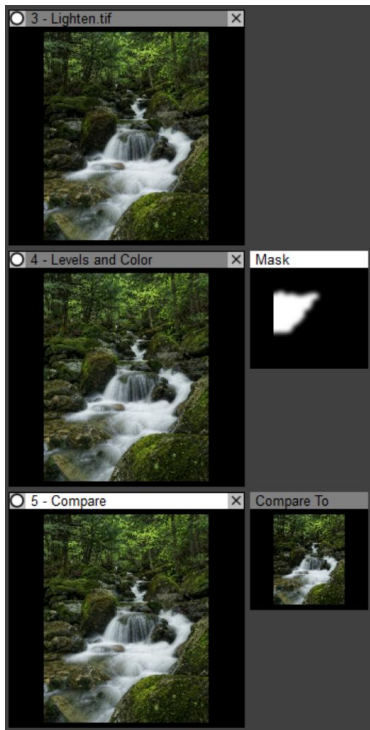
### **Afterthoughts**

If you decide after closing the dialog box that you want to fine tune some of the settings, double click on the transformation's thumbnail in the image browser to re-open its dialog box, picking up right where you left off. Make your changes and then click OK to save the new version or Cancel to stick with the previous settings.



## Comparing Images

While you can gauge the effect of a transformation by turning its bypass button on and off, there is another way to compare two images that gives you more options—the Compare transformation. Once you select the two images you want to compare, the Compare transformation lets you highlight their differences using a variety of tools.



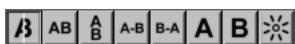
To set up, make the first image you want to compare the current one by clicking on its thumbnail in the image browser, and then select Transformation/Compare from the main menu. This brings up the Compare dialog box:



By default, the Compare transformation compares its input image (the one immediately above it in the image tree) to the one above that. This is confirmed where it says Image A is Levels and Color (the transformation we used to lighten the image) and Image B is Lighten.tif (the original image). If you want to compare the input image to some other image, you can click on the miniature image in the Compare To control to pop up a menu from which you can select other images.

Unfortunately, it is difficult to illustrate how well this transformation works without video, since a lot of the effect comes from switching rapidly between images.

The compare tools are laid out in the tool bar that looks like this:



From left to right, the options are:

### Moving Curtain

As shown above, the moving curtain method shows a vertical line separating Image A on the left and Image B on the right. You can drag the line left or right to compare the image on one side with the other.

### Horizontal side-by-side

### Vertical side-by-side

These methods simply display the two images side by side, either horizontally or one above the other. Usually portrait images are best displayed horizontally and landscape images vertically to maximize the use of the available screen space.

### Difference

### Reverse Difference

These methods subtract one image from the other and display the difference. Where the result is a mid-level gray, the two images are identical. You can magnify the difference using the Strength slider. This is the most sensitive way to see where there are differences, but it can be harder to interpret them.

**Show Image A only**

**Show Image B only**

By clicking one of these buttons and then the other, you can quickly switch between images which makes the differences much easier to see.

### **Blink**

This method automates switching between images by blinking from one to the other at an adjustable blink rate. This is a very sensitive way to see differences between two images since it makes use of the motion detectors in the human visual system.

The other tool bar controls zooming:



These buttons zoom in, zoom out, zoom to fit the entire image and zoom to 1:1. Scrolling is handled by scroll bars that are displayed as necessary.

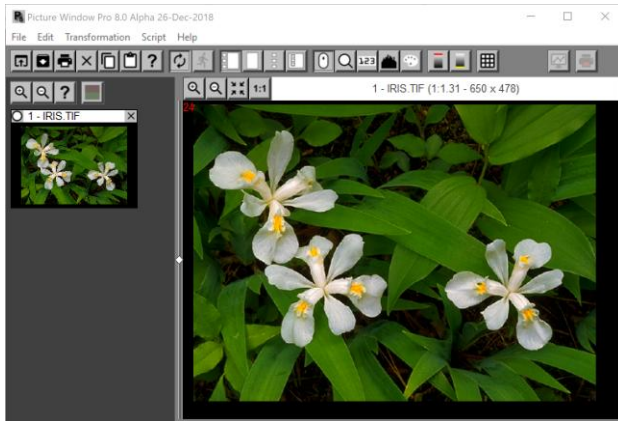
# Managing the Display

## The Display Tool Bar

You can control how the image browser and current image are displayed using a group of buttons on the main tool bar:



From left to right, these buttons display both the image browser and the current image with an adjustable separator bar between them, just the current image, just the image browser, or the image browser in a separate window.



Both



Main Image Only

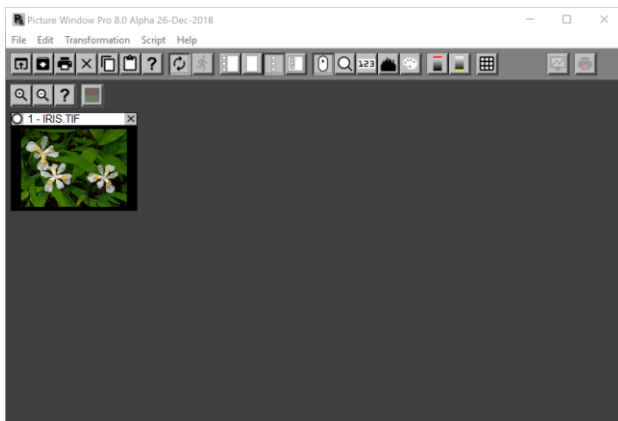


Image Browser Only

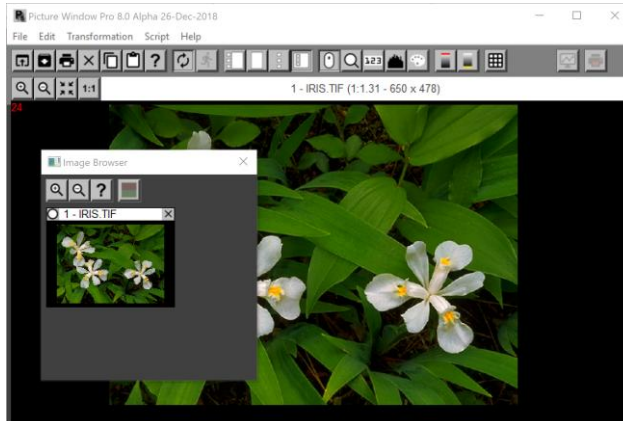


Image Browser in a Separate Window

You can cycle through the first three options using the keyboard shortcut: **Ctrl-D**.

## Full-Screen Display

To display the current image full-screen against a black background, use the Edit/Full Screen command from the main menu or the keyboard shortcut: **Ctrl-F**. This hides everything but the current image, scaled to fill the screen (or displayed at a zoom factor of 1:1 if the entire image fits on the screen unscaled). To return to normal display, press any key or click the mouse button.

## Changing the Border Color



The border color is the background color surrounding images in the main image area. You can customize the border color using the File/Preferences command. Using the tool bar at the top of the main windows, you can also quickly switch among three options: your custom color, black and white.

## Multiple Monitors

If the image browser is placed in a separate window, you can drag it to a second monitor to leave more room on your main monitor for images. You can also configure transformation and mask dialog boxes to come up on a second monitor using the File/Preferences command from the main menu.

## Icon and Text Size

Picture Window automatically adapts itself to high resolution monitors by sizing its icons and text according to the scale factor selected in Windows Settings/Display Settings/Scale and Layout. You can also re-scale icons, sliders and text in Picture Window's user interface and select different fonts using the File/Preferences command from the main menu and pressing the Font button.

## Switching Modes

One common source of confusion when using Picture Window is how it handles different modes. Modes define what happens when you move the cursor, click, drag, or use the mouse scroll wheel on an image in the main image area.

### Modes

Here are some examples of modes:

- When a color picker is active and its probe is turned on, clicking on an input image in the main image area sets the current color to the color of the image where you clicked.
- When the Color Balance transformation is active, clicking on the input image sets the color cast to remove.
- When the Crop transformation is active, a cropping rectangle is displayed over the input image which you can reposition to set the cropping rectangle.
- When the Magnifier tool is active, clicking on an image displays a magnified version at the cursor location.
- When the Measure tool is active, you can position control points to measure the distance or angle between two points or line segments.
- When no transformation, tool or control is active, clicking and dragging the input image scrolls it. Rotating the mouse scroll wheel zooms the image in while trying to keep the part of the image at the cursor location centered or zooms it out.

### Setting the Current Mode

Only one mode can be active at a time since they all compete for what happens in the same main image area.

Here is how to control which mode is active at any given time:

- Set the current mode by clicking anywhere on the title bar or background of a window or control or by changing any of its settings. This makes it the active window and turns on its mode, if any. In most cases you can click anywhere in the window as well.
- To override the current mode and revert to the zoom and scroll mode, hold down the Alt key on the keyboard while dragging the cursor or rotating the mouse scroll wheel, or hold down the Alt key and use the arrow keys.

So, for example, if your transformation overlay disappears, click on the transformation dialog box to bring it back. Or, to activate the color picker probe, click on the color picker window and make sure its eyedropper button is depressed.

When a transformation dialog box is open, its mode (if any) is overridden when you open a color picker, a mask dialog box, or some other window that takes control over the image area. When you close the window that appropriated control, it automatically returns control back to the transformation dialog box. Thus, to return control to the transformation, you can either click on the transformation dialog box or close the extra window.

### Overlays on Inputs

Some transformations such as Layout display overlays on their auxiliary input images. If the overlay is not visible, you may need to select the input using the image browser to see it. To do this, click on the half-size thumbnail for the input image displayed just to the right of the main thumbnail.

## **Transformation Dialog Boxes**

To keep the screen from getting overly cluttered with dialog boxes, when you change the current image, any transformation dialog box it may have open is closed. To get it back, double click on the image and the dialog box will reappear.

# A Deeper Dive into the Image Browser

## Tool Bars



There is a group of three buttons at the top of the image browser; the first two increase or decrease the size of thumbnails so you can trade off seeing more detail in each one against seeing more of them at a time. The third button displays Image Browser help.



When one of these buttons is depressed, thumbnail images in the image browser, including masks and inputs, are hidden or unhidden. This can be useful if you have a lot of transformations and need to see more of them at once on the screen. If no images are selected, all thumbnails are affected. If any images are selected, only the selected images are affected.



Click this button to display or hide the Selection and Close/Copy tool bars. These features are described later.

## Branches

When you open an image file and apply a series of transformations to it, the collection of images you create is called a branch. The first image (typically the byproduct of a **File Open**), is at the top and each transformation you apply adds a new thumbnail just below the last one. Since each image forms the input for the one below it, a branch is a visual representation of all the stages you pass through from opening an image file to creating the final processed version.

## The Current Image

The current image is highlighted by its white caption background. When you click on a thumbnail, it becomes the current image and a full-size version is displayed in the image area. You can use this to review all the changes you have made to the original image by clicking on the intermediate thumbnails or to quickly flip back and forth between two different images to compare them. It is important to keep track of which image is current as this marks the place where new transformations are inserted.

If you select an image by holding down the Alt key while clicking on its thumbnail, the new image is zoomed and scrolled to match the previously current image, assuming it was the same size. This lets you quickly compare a region of interest across several versions of the same image or other images of the same size. If the images are different sizes, Alt-click is the same as a regular click.

## Scrolling the Image Tree

If the entire image tree does not fit in the available space, scroll bars are displayed to let you see the rest. The current image is normally kept in view unless you manually scroll it off the screen. If you need to see more of the tree on the screen at once, you can use the buttons at the top of the image browser to make the thumbnails smaller, or you can drag the separator line to the right to make more room for the image browser at the expense of reducing the main image area width. You drag the separator bar by dragging the white diamond in its center.

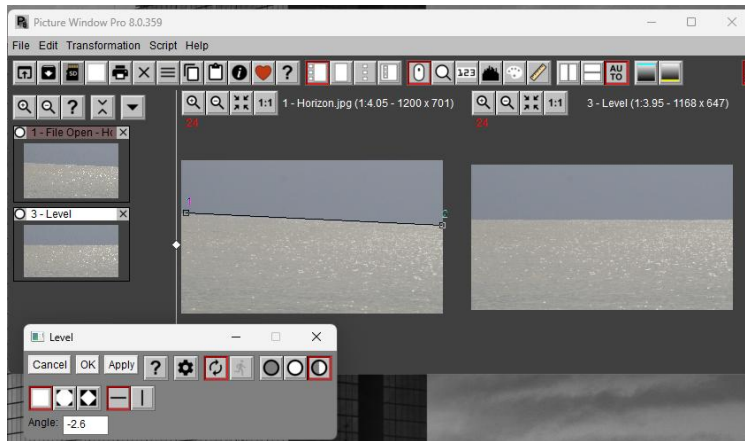
There are two other ways you can scroll the image browser:

- If the cursor is over the image browser, the mouse scroll wheel scrolls the image tree vertically. If you hold down the Shift key, it scrolls horizontally.
- You can click in the blank space between thumbnails and drag to scroll the image tree.

## Transformations

A transformation is an image operation such as resizing, cropping, color balancing, selective color correction, sharpening, blurring, retouching, converting color to black and white, special effects, and so on. Transformations generally operate on an input image and produce an output image.

For example, take the Level transformation (Transformation/Geometry/Level from the main menu).



For some transformations such as this one, an overlay is displayed over the input image (the one on the left). In the case of **Level**, the overlay is a line segment with a control point at either end. Dragging the control points lets you position the line over the horizon (or some other linear feature you want to make horizontal in the output image). Based on the angle of the line segment, the image is then rotated to make the horizon level and the rotated image becomes the output image (the one on the right).

You may have noticed that the output image is a little smaller than the input image. Some additional controls let you specify how you want the output image cropped.



- The first button crops the output image as large as possible without including any black border from outside the image area. This is the default setting, although it does make the output image smaller than the input image.
- The second button crops the output image to the same size as the input image. Some black border will appear in the corners.
- The third button crops the output image to include the entire input image. This adds an even larger black border in the corners and makes the output image larger than the input image.



The other tool bar lets you select whether to rotate the output image to make the line segment horizontal or vertical. Select vertical if you want to make a vertical element in the image stand up straight.

When you click **OK**, several things happen:

- The output image is finalized and inserted into the current branch, immediately after the current image. If an error occurred when calculating the new image, its thumbnail displayed in red with an error message.
- The output image becomes the current image.
- The transformation dialog box is closed.
- If the image you were working on is in the middle of a branch, the following transformation in the branch will now take the output image as its input image and the changes will propagate down through the branch to the end, as well as to any other images that depend on any image that was altered.


Clicking the Apply button instead of OK does the same thing, except it does not close the transformation dialog box. Use this option if you want to check your results but expect to make further changes to the transformation settings before closing the dialog box.

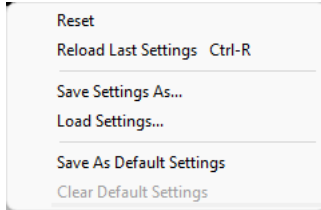
Clicking the Cancel button closes the dialog box without creating a new image. This brings you back to where you started.

Clicking **?** displays the transformation's help file.

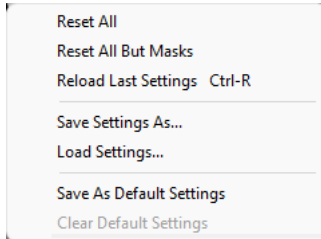


## The Settings Menu

Clicking  displays a settings menu for the transformation. The first few items in the menu are the same for all transformations. Some transformations add extra items to the end of the menu to let you change infrequently used settings.



or



**Reset** -- This resets all the transformation's settings to default values. If you have changed a lot of settings and just want to start over, this is the quickest way.

For most transformations that have Amount controls and therefore support masks, there are two reset options:

**Reset All** -- resets everything, including all Amount controls and their associated masks, if any.

**Reset All But Masks** -- resets everything but leaves all Amount controls and their associated masks intact.

**Reload Last Settings** -- This reloads the settings from the last time you ran the transformation and clicked OK. Use this if you want to repeat the last operation.

**Save Settings As** -- This saves all the transformation's settings in a file for later use. If you have several groups of settings you regularly use with the same transformation, this is a good way to store them.

**Load Settings** -- This reloads the transformation's settings from a previously saved file.

**Save as Default Settings** -- Saves the current settings in a file named Default. These become the new default settings when the transformation starts up or when you select Reset.

**Clear Default Settings** -- Clears the current default settings by deleting the Default settings file. This item is grayed out if there is no default settings file. If there is no default settings file, built-in defaults are assigned when the transformation starts up.

Settings files are organized into separate folders by transformation. The settings filename extension is also unique to the transformation. Picture Window settings folders are stored in a Picture Window Pro subfolder in My Documents. Saving this folder is an easy way to back up all your settings files or to transfer them from one computer to another.

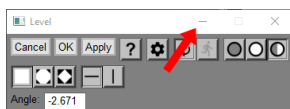
## Transformation Dialog Boxes

You can have more than one transformation dialog box open at a time. However, to avoid screen clutter only the one for the current image is visible. Selecting a new image hides the dialog box for the previously current image, if any, and displays the dialog box for the new image, if any.

Most transformation dialog boxes can be resized by dragging any of their corners or edges. This enlarges or shrinks variable size elements in the dialog box such as sliders, curves or preview areas.

While the default location of a transformation dialog box is normally in the lower left corner of the main window, it can be dragged to a new position to get it out of the way. This is especially useful if you have a large monitor and the main window does not take up all of it, or if you have a second monitor. If you have two monitors, you can also use the File/Preferences command from the main menu to set the initial location of transformation dialog boxes to the second monitor.

Another way you can get transformation dialog boxes out of the way is to click the minimize icon in the caption bar.



This shrinks the dialog box down to an icon in the task bar adjacent to the Picture Window icon.

You can restore the dialog box back to its original size by clicking the





## Editing Transformations

Double-clicking on a thumbnail re-opens its transformation dialog box and restores the settings you used to create the image. At this point you can make any changes you want. When you click OK, the output image is recalculated, and the changes ripple through all the images below. The transformation dialog box is then closed. Clicking the Apply button in the transformation dialog box does the same thing but leaves the dialog box open so you can make further adjustments without having to re-open the dialog box.

Editing transformations is a very powerful feature — it lets you go back and edit any link in the chain of transformations that produced a final image

Editing a File Open top-level image lets you change which file is opened, allowing you to apply all the transformations below it to the new file.

## The Bypass Button



**Bypass off** -- image transformation is computed normally



**Bypass on** -- image transformation is bypassed

Each thumbnail in the image browser has a small circular button in its upper left corner. Clicking this button toggles the bypass setting, causing it to alternate between white and gray. Gray means the transformation is bypassed and its output image temporarily becomes a copy of the its input image. White means the transformation is not bypassed and its result is computed normally. In effect, toggling the bypass button turns the transformation on or off. This gives you a quick way to see before-and-after versions for any image of the branch or to see what the effect of one transformation has on downstream images.

Some transformations such as File Open cannot be bypassed. Others like splitters and side branches are always bypassed.

The bypass button is also active when the associated transformation dialog box is open, and this is one way to switch between viewing the input image and the result image.

Right-clicking the bypass button toggles the bypass setting for the image without making current. This can be handy if you are looking at or editing an image and you want to see the effects of bypassing one of the images it depends on.

To turn bypass on or off for several transformations at once, see **Select and Close/Copy Tool Bars** below.

## Caption



By default, the caption for each thumbnail contains the name of the transformation that created the image. File Open is a special case and displays the filename of the image file. The caption for the current image is highlighted in white.

You can replace the default caption with a custom caption via the Image Info dialog command (Edit/Image Info from the main menu). The caption also includes a number unique to the image -- this can be useful when selecting images, and several images have the same caption.

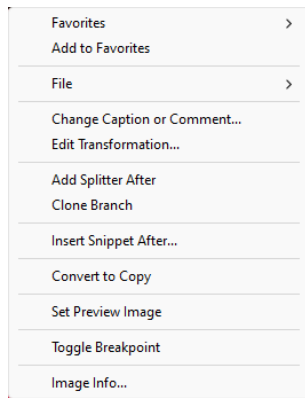
## Close Button



Each thumbnail in a branch has a small X button in its upper right corner. Clicking this button displays a confirmation dialog box that gives you the option of closing just the one image you clicked on or also closing all the ones below it (if any).

## Right-Click Menu

If you right-click on a thumbnail, Picture Window displays a popup menu to let you select certain common commands more conveniently.



**Favorites** – this submenu lets you select one of the transformations in your Favorites list.

**Add to Favorites** – adds the current transformation to your Favorites list.

**File** – displays a sub-menu including Save As, Save Back and Re-Save.

**Change Caption or Comment** – lets you edit the caption displayed for a transformation or add a long comment to document its function.

**Edit Transformation** – the same as double-clicking on a transformation. This re-opens the transformation dialog box using its current settings so you can resume the transformation where you left off.

**Add Splitter After** (non-splitters only) – inserts a splitter immediately after the current image.

**Clone Branch** (non-splitters only) – inserts a splitter above the current image and copies the current image and all the ones below it on the current branch to the new branch.

**Insert Snippet After** – lets you insert a snippet after the current transformation. For more on snippets, see the document Scripts.pdf.

**Add Branch to Splitter** (splitters only) – adds a new, empty side branch to the current splitter.

**Convert to Copy** – converts the top-level transformation of the current branch to a Copy transformation.

**Set Preview Image** (non-splitters only) – causes the current image to be tracked in the Preview Window.

**Toggle Breakpoint** – used to set or clear breakpoints. Breakpoints are used in batch processing workflows to temporarily suspend operation, to give you a chance to make changes.

**Image Info** – displays the Image Info dialog box for the current image. This includes general information about the image as well as camera settings, EXIF and GPS data.

## Multiple Branches and Side-Branches

There are two ways to create multiple branches: by creating a new top-level image or by inserting a splitter into an existing branch.

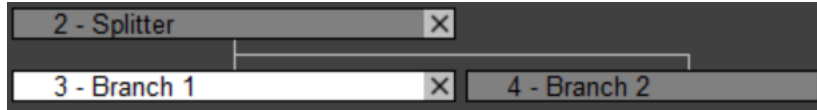
### Creating New Top-Level Images

Images you create that do not have an input image are called top-level images. They are displayed at the top of the image browser and each one starts a new branch displayed next to the previous branch. The most common ways to create a new top-level image are File Open, File New and pasting an image from the clipboard. There are also a few other transformations that have no input image such as Layout, Test Patterns, Combine Channels, and these also create new top-level images.

Since each new branch is displayed far enough to the right of the previous branch to accommodate its full width, there may be horizontal gaps between top level images. New top-level images are created at the far left and any existing top-level images are shifted over one spot to the right to make room.

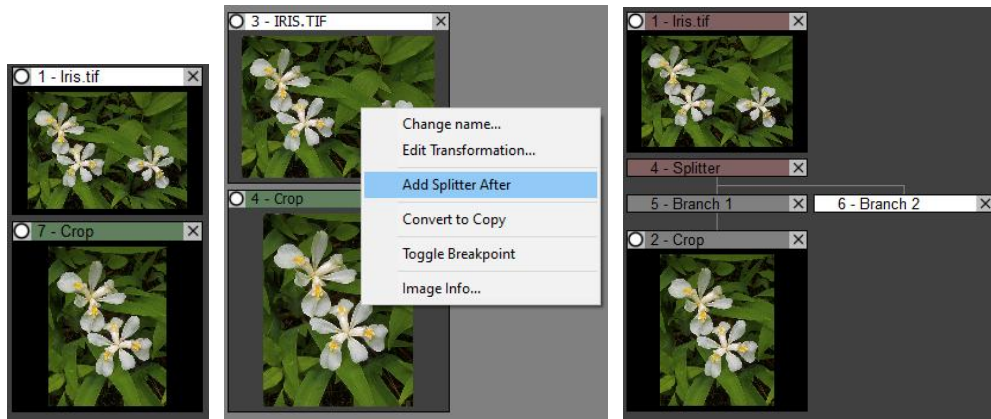
### Splitters and Side-Branches

To create side-branches on a branch, you insert a splitter via the Insert Splitter After command. Splitters allow the same input image to be shared by multiple branches which are displayed in a row below the splitter connected to it by lines.



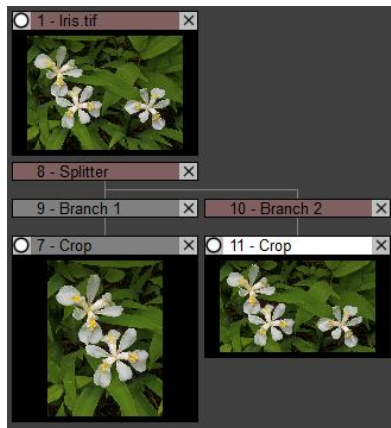
Each of these forms the start of a new branch below to which you can add new transformations. The input image for the first image in each new branch is always the image immediately above the splitter. It's called a splitter because any changes in the image above the splitter flow down to all of its branches, a little like the way a cable television splitter sends the signal at its input connector to multiple output connectors.

In this example, a side branch is added to the top-level image by right-clicking on the Iris.tif image and selecting Add Splitter After from the popup menu. This inserts a splitter with two branches below it:



Any images below the current image remain as part of Branch 1 and Branch 2 is empty.

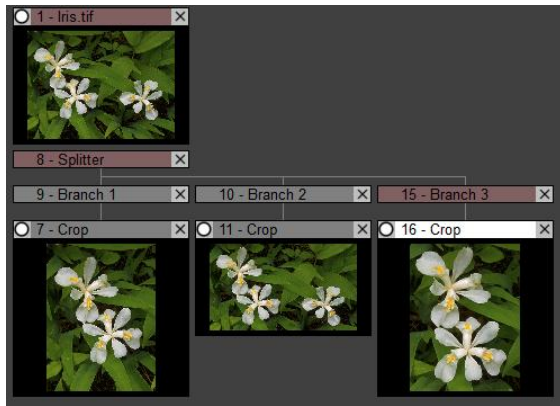
To explore a different treatment of the image, select Branch 2 to make it the current image and add a new transformation:



Now you have two branches that share the image at the point where you inserted the splitter. By clicking alternately on the two versions of Crop, you can compare the results of the different creative choices.

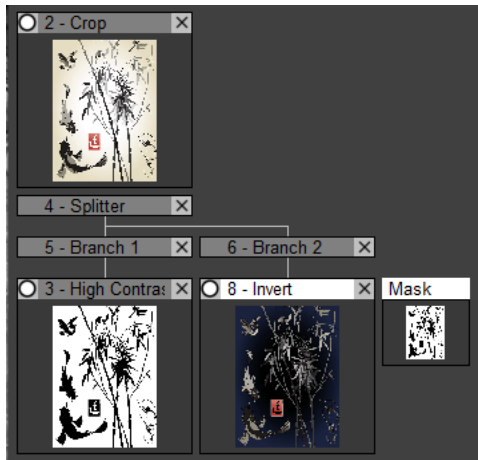
The splitter does not actually make a copy of its input image—it just links back to the original image. Side-branches are all independent of each other, so what happens in one does not affect the others.

If the current branch is a splitter, you can use the Add Side-Branch command to add a new side branch to the current splitter, so you can have multiple side-branches originating from the same splitter. To add a third branch to the image tree, right click on the splitter and select Add Side-Branch from the popup menu. Then you can add more transformations to the new branch.



## Other Uses for Splitters

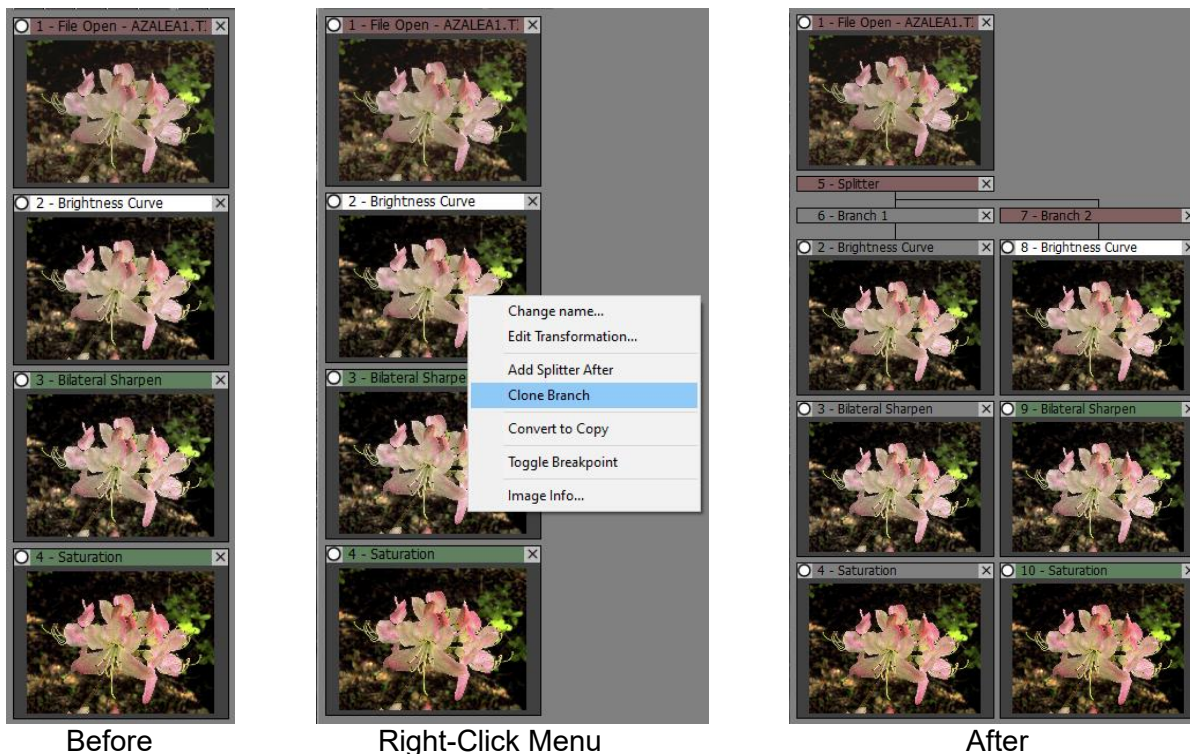
In some cases, it may be necessary to use a splitter, such as when combining two modified versions of an image with each other. For example:



Here, the High Contrast transformation is used to create a mask which is in turn used by the Invert transformation to invert the areas where the mask is white. Placing the Invert transformation below the High Contrast without a splitter would invert the wrong image.

## Cloning Side Branches

A common use for side branches is to compare two or more alternative processing scenarios applied to the same image. A quick way to do this is with the Clone Branch command which inserts a splitter and copies a transformation and all the ones below it on the current branch to the new branch. To do this, right click on the topmost transformation you want to copy and select Clone Branch from the popup menu.



After cloning the branch, you have a second copy you can modify without disturbing any of the original transformations. Comparing the results of the two branches is easy – just click on one thumbnail and then the other or use the Compare transformation.

## Naming and Removing Splitters and Side Branches

By default, splitters are named Splitter and side branches are named Branch 1, Branch 2, and so on, but it is highly recommended that you rename each branch to help you remember what each one does. To rename a splitter or branch, double click its thumbnail.

To remove a branch and all the images below it, click on the close icon (the small x) in its title bar. Removing the next to last branch removes the splitter above it as well since at this point there is only one branch left and the splitter serves no purpose. To remove a splitter and all the branches below it, click on its close icon.

## Image Info

The Image Info dialog box displays useful information and metadata associated with an image. There are two ways to get to the Image Info dialog box:

- Right-clicking a thumbnail or the main image and selecting Image Info from the context menu.
- Selecting Image Info from the Edit menu in the main menu bar.



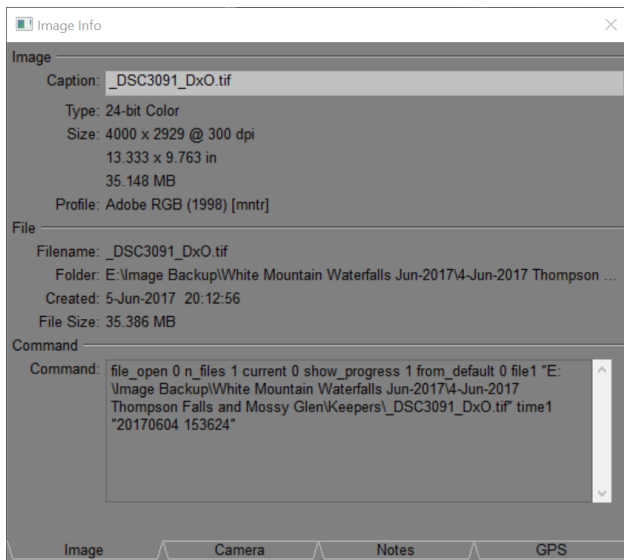
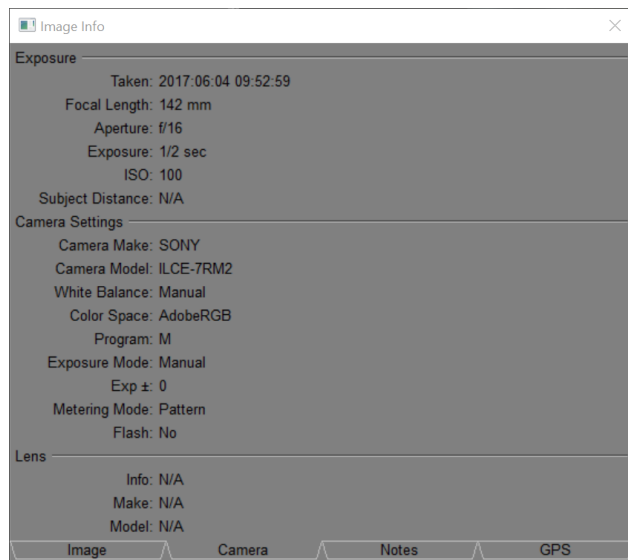
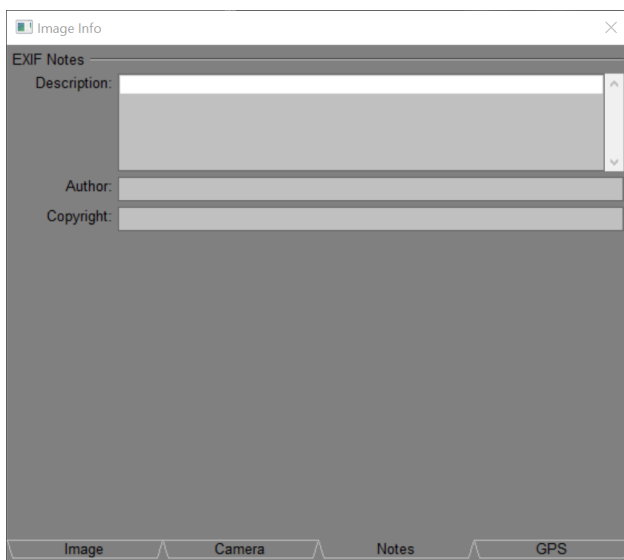


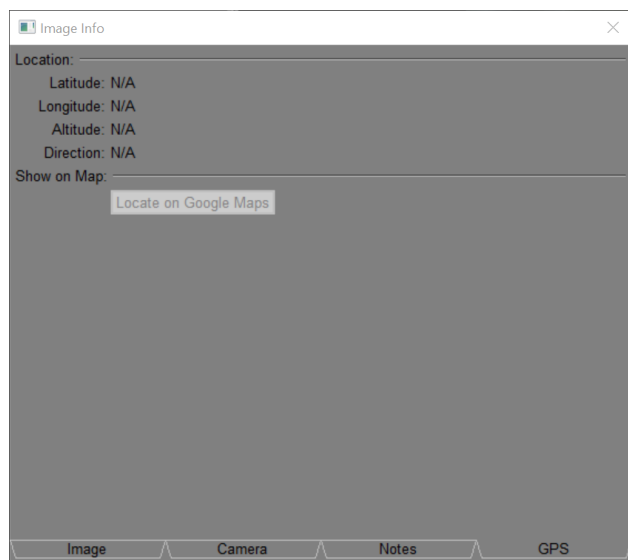
Image tab



Camera Tab



Notes Tab



GPS Tab

The Image tab displays basic image and file information. At the top of the first tab is the image caption – you can enter a new caption here if you wish. The Command readout shows you the internal command line Picture Window uses to record the transformation's settings.

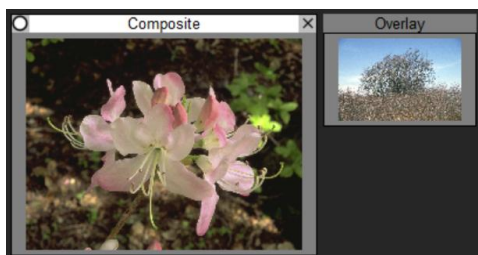
The Camera tab displays exposure, camera and lens information.

The Notes tab displays descriptive information about the image.

The GPS tab displays GPS location data (if any) and lets you view the image location using Google Maps.

## Additional Inputs

Some transformations (e.g. Composite, Layout, Filter or Stereo) either require or can accept multiple input images. In this case, half-size input images are displayed to the right of the main branch image.



Input images cannot be closed or bypassed, so they have no close or bypass icons. Clicking an input image does however switch the main display to that image so you can examine it more closely or flip back and forth between the different input images if there are more than one.

Transformations that only support auxiliary inputs such as the Layout, Combine Channels, Texture, Test Patterns and Wave transformations, are created as top level images, even though they may depend on other images. While they are displayed alongside other branches, they are still recalculated whenever any of the images they depend on is modified.

## Masks

Many transformations have Amount controls which can either be a simple slider that varies the strength of the transformation uniformly over the entire input image, or they can specify a mask image to vary the effect over different parts of the input image. Some transformations may have more than one Amount control. For every Amount control with a mask assigned to it, a half-size thumbnail of the mask is displayed in much the same way as for input images.



As a convenience, if you double-click on the mask thumbnail, the transformation is opened and then the mask dialog box is opened as well so you can edit the mask.

## Rearranging the Image Tree

Before getting into the mechanics of reorganizing the image tree, it is important to remember one important concept:

*Rearranging the image tree rearranges its transformations – not its images.*

The same transformation, when copied or moved to a different location in the image tree can produce a totally different image. After each change to the image tree, all affected transformations are recalculated, and their images are regenerated. Moving transformations around is not the same as moving images around.

### Moving a Transformation Up or Down

You can move the current transformation up or down one position in its branch either with the **Edit/Move Up** or **Edit/Move Down** commands from the main menu or by the keyboard shortcuts **Shift-↑** or **Shift-↓**. This swaps the current transformation with the one before it or the one after it in the branch.

While some pairs of transformations produce the same result when performed in either order, in general this is not true. Consequently, moving a thumbnail up or down causes a recalculation of all subsequent images in the branch and can change the way the images look.


### Moving a Transformation Left or Right

You can move top level transformations or side-branches left or right in the image tree either with the **Edit/Move Left** or **Edit/Move Right** command from the main menu or by the keyboard shortcuts **Shift-←** or **Shift-→**. These commands are purely cosmetic – only the image browser display is affected.

### Select and Close/Copy Tool Bars

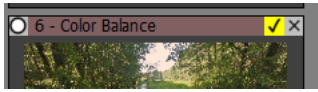
These tool bars let you select multiple images and either close or copy them to a new location in the image tree.




The tool bars are displayed at the top of the image browser when the  button is depressed. The Select tool bar lets you select one or more transformations. The Close/Copy tool bar lets you close or copy the currently selected transformations.

Selected transformations are marked with a yellow check mark in their thumbnail caption bar:





Selection is independent of setting the current image – you can make an image current by clicking on it without affecting the yellow check marks and you can select multiple images without affecting the current image.






To close transformations, first select them and then click .

To copy transformations, first select them, then click where you want to copy them to, and then click .

**Note: Be careful when rearranging the order of images within a branch of the image tree as this can cause problems, particularly if some of the transformations depend on the size of their inputs. For example, retouching tools or content-specific masks may not work as intended if presented with an image other than the one they were created to modify.**

### Select Tool Bar

This tool bar lets you select or deselect one or more transformations in the image tree as follows:

-  Selects the current transformation. If already selected, it is deselected.
-  Selects the current transformations and all the ones below it on the current branch. If the current transformation is already selected, it is deselected along with all the transformations below it on the current branch.
-  Selects the current transformation and all the ones downstream from it. This is like selecting all the transformations below the current image, but also includes transformations that depend on the current transformation via auxiliary inputs or masks. If the current transformation is already selected, it is deselected along with all downstream transformations.
-  Selects the current transformation and all the ones upstream from it. This includes any transformations the current transformation depends on via auxiliary inputs or masks. If the current transformation is already selected, it is deselected along with all upstream transformations.
-  Selects all the transformations in the image tree. If any transformations are already selected, all the transformations are deselected.

In addition to using the Select tool bar, you can also select transformations by clicking on a thumbnail in the image browser:

- |                  |                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Click            | Sets the current transformation.                                                                                                    |
| Ctrl-Click       | Selects or deselects a transformation.                                                                                              |
| Shift-Click      | Selects the range of transformations between a transformation and the current transformation, assuming they are on the same branch. |
| Ctrl-Shift Click | Selects a transformation and all the ones below it on the current branch.                                                           |

### Navigating Among Selected Transformations

If you have selected more than one transformation, you can use the right or left arrow key to quickly cycle through just the selected images. Each time you press the right or left arrow key, Picture Window makes the next or previous selected transformation current, causing its image to be displayed in the main image area. This lets you quickly compare the results of any collection of transformations by flipping the display back and forth between them. If all the selected images have the same dimensions in pixels, the zoom factor and scroll position is preserved as you switch from one image to the next, so the same part of the image is always in view.

If no transformations are selected or only one transformation is selected, the left and right arrow keys behave in their normal way, namely to go to the end of the previous or next branch. You can use this default behavior for example to compare the end results of different processing options.

### Close/Copy Tool Bar

This tool bar lets you either close or copy the currently selected transformations. It also lets you bypass or un-bypass the currently selected transformations.



Closes the currently selected transformations, after displaying a confirmation dialog box.

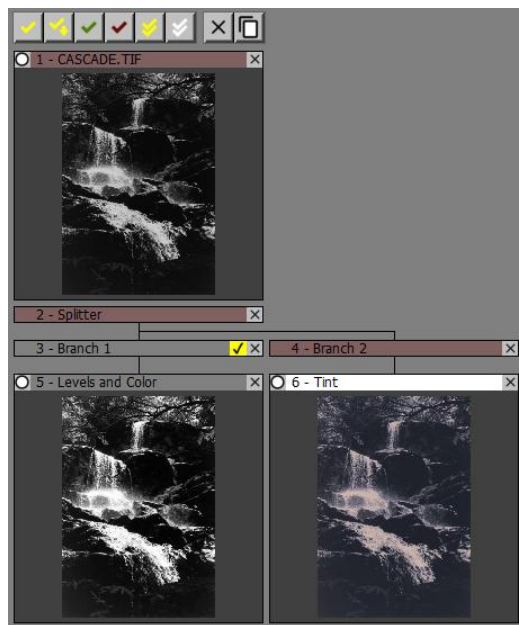
Closing a top-level transformation, a splitter or a side branch closes all the transformations below it.

If Autosave is enabled (see File/Preferences), the workspace is saved before the close operation is performed. This gives you a way to recover if you accidentally delete one or more images.

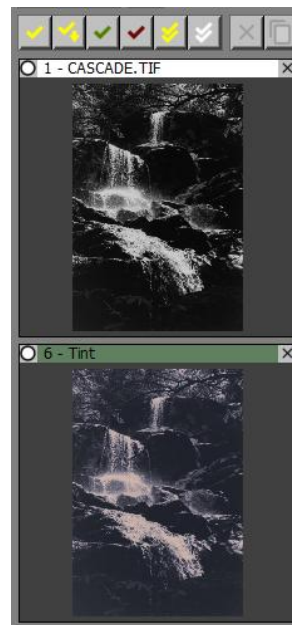
After the close, any splitters left with less than two branches are removed.

Any transformations that reference a closed transformation either as an auxiliary input or as a mask have their references reset.

Close Example:



Before Close



After Close

Closing Branch 1 also closes the transformation below it. This leaves the splitter with only one remaining branch so it is removed.



Makes copies of the currently selected transformations and inserts them immediately after the current transformation.

When you copy a top-level transformation, the copy is created as a new branch instead of placing it after the current transformation. If the top-level transformation is a File Open, you are prompted to select a new file since the same file cannot be open in two different branches.

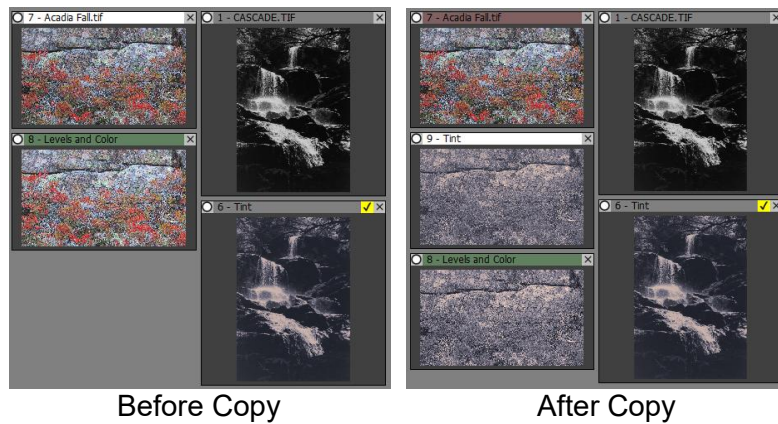
In order to maintain the integrity of the image tree, any splitters or branches between the topmost selected transformation and all the other selected transformations are also selected.

After copying, transformations remain selected in case you want to close them or copy them to another location.

If Autosave is enabled (see File/Preferences), the workspace is saved before the copy operation is performed. This gives you a way to recover if you accidentally mess up the image tree.

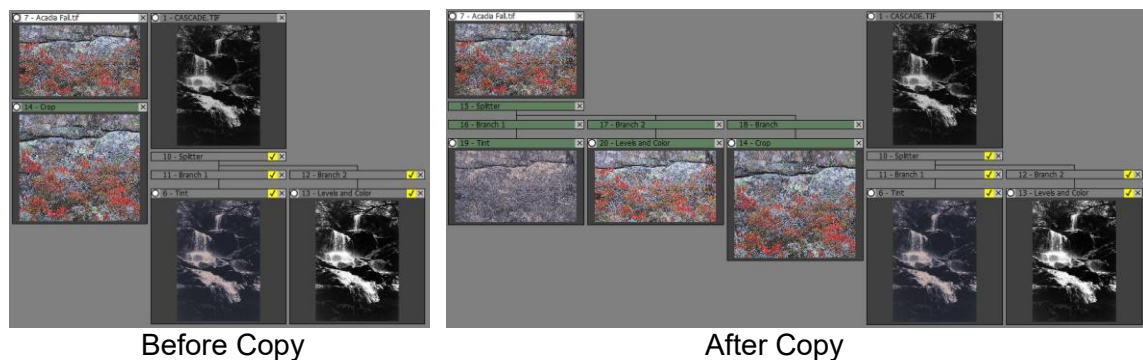
After the copy, any splitters left with less than two branches are removed.

Example 1:



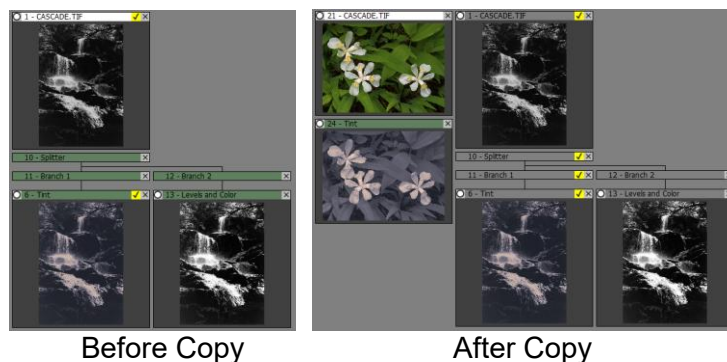
This makes a copy of the Tint transformation and inserts it after Acadia Fall.tif.

Example 2:



This makes a copy of the splitter and both of its branches and inserts it after Acadia Fall.tif. An extra branch is added to the splitter to accommodate the existing Crop transformation.




Example 3:




This makes a copy of a top level transformation and one of the transformations below it. Picture Window then requests the name of a new file to open, and the copy is placed in a new branch. The splitter and Branch 1 are automatically added to the selection, but then removed in the copy because the splitter only had one branch.



Bypasses all the currently selected transformations. Any transformations whose bypass setting is permanently on or off are unaffected. If none of the selected images can be bypassed, the button is grayed out.

-  Un-bypasses all the currently selected transformations. Any transformations whose bypass setting is permanently on or off are unaffected. If none of the selected images can be un-bypassed, the button is grayed out.
-  Copies the selected transformations to a snippet file. Snippets are sequences of transformations you can save and re-insert later. If you find yourself entering the same sequence of transformations over and over, saving them as a snippet can save you lots of time since you can insert all the transformations in a saved snippet in a single operation. For more information on Snippets, see Scripts.pdf or the help topic on Scripts.
-  Inserts a saved snippet immediately after the current transformation. For more information on snippets, see Scripts.pdf or the help topic on Scripts.

### Tips

-  To see more of the image tree at once while rearranging it, you can click the Show Image Browser Only button on the main tool bar.

## Order of Operations

Most transformations are relatively insensitive to the order in which they are applied. For example, sharpening, tonal adjustments and color correction give pretty much the same results no matter what order you do them in. One set of exceptions includes creating masks or using the retouching tools (paint, clone, line and arrow, speck removal and scratch removal). Masking and retouching are specific to the image dimensions in pixels, so if the input image changes size for any reason (such as cropping it or adding a border or replacing it with a different image), they are likely to apply their corrections to the wrong parts of the image.

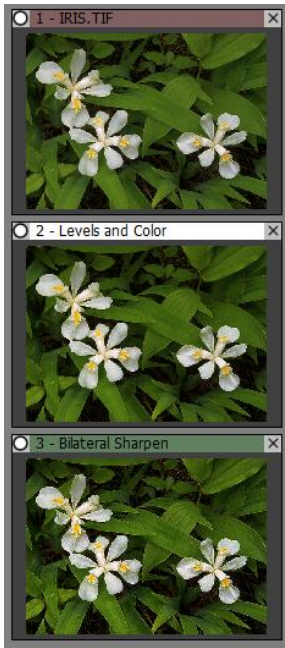
The easiest way to avoid image size problems is to perform final cropping at or near the end of the branch. Otherwise, if you go back to adjust the way the image is cropped, you will change the image size and may invalidate any downstream masks or retouching.

## Image Dependencies

The current transformation depends on its inputs and in turn on all the transformations those inputs depend on. These input transformations are called upstream transformations. Similarly, there are downstream transformations that depend, possibly via one or more intermediary transformations, on the current transformation. In other words, if you change a transformation, all the downstream transformations are also affected. Transformations that are neither upstream or downstream of the current transformation do not affect it when they are modified and are not affected by the current transformation when it is modified.

In the case of a simple linear branch of transformations that are entered in sequence, thumbnails displayed above the current image in the image browser are upstream, and thumbnails displayed below the current image are downstream. On the other hand, if there are side branches, masks that refer to other transformations, or additional inputs, the dependency relationships can get more complicated. Since downstream transformations cannot be selected as parameters (because this would create a circular reference), it can be useful to see how transformations are related.

## Color Coding



To help you see which transformations are upstream or downstream from the current transformations, the caption bar background is color coded to indicate which images the current transformation depends on (dark red), which transformations depend on the current image (dark green) and all other transformations (gray).

While a transformation is being recalculated, its caption background is temporarily colored cyan. This lets you watch image recalculation progress as it propagates through the image tree.

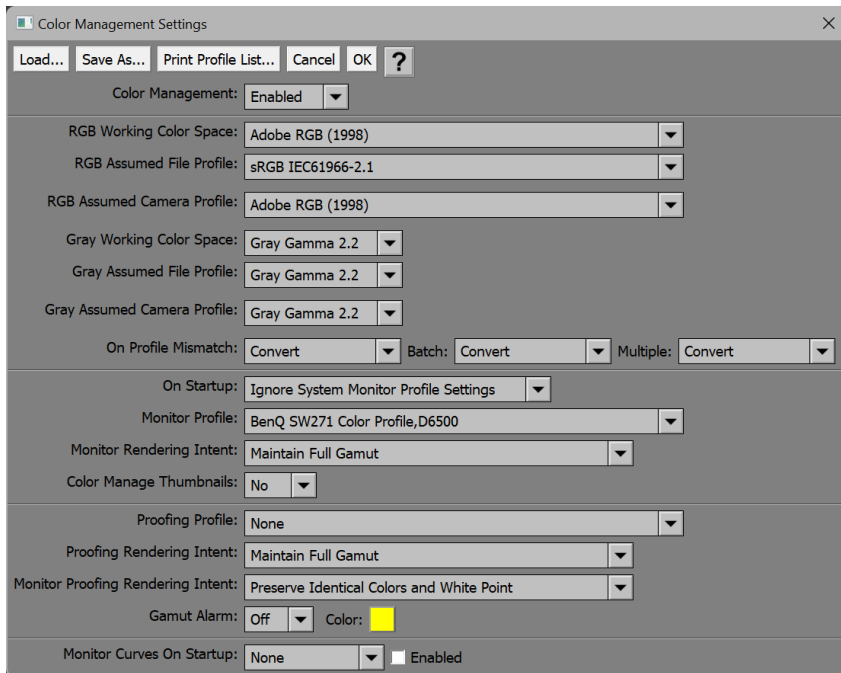
For complete information on upstream and downstream transformations as well as masks and auxiliary inputs, right-click on a thumbnail and select Show Dependencies... from the drop-down menu. This will let you see and trace dependencies for any transformation. See its help topic for details.

# Color Management Quick Start

This section focuses on what you need to set up and use basic color management.

## The Color Management Dialog Box

Most of the color management settings are in the Color Management dialog box, accessed by the File/Color Management command from the main menu.



## Color Management

To use color management, you need to enable it.

### RGB Working Color Space

This is the color space you convert your images to when you open them, use to edit images, and convert from when printing.

If your digital camera can shoot in Adobe RGB, I recommend you do so and use Adobe RGB as your working color space. Ideally, in this case, you should also use a monitor that can display close to 100% of the Adobe RGB color space.

If you are preparing images for the web, to use in presentations, or to email to others, then use sRGB as your working color space.

### RGB Assumed File Profile

This is the color space that you assign when opening an image that has no embedded profile. Use sRGB unless you have a good reason to choose something else.

### RGB Assumed Camera Profile

This the profile that will be applied to color camera files that have no embedded profile.

### Gray Working Color Space

Use Gray Gamma 2.2 unless you have a good reason to do otherwise.

### Gray Assumed File Profile

Use Gray Gamma 2.2 unless you have a good reason to do otherwise.

### Gray Assumed Camera Profile

This the profile that will be applied to black and white camera files that have no embedded profile.



## On Profile Mismatch

This setting determines what happens if you open an image file and its profile does not match the working color space. Ask on Mismatch is the safest setting, but if you don't want to be bothered by a lot of warning messages, set it to Convert.

## Batch

Set to Convert.

## Multiple

Set to Convert.

## On Startup/Monitor Profile/Rendering Intent

If you have a monitor calibrator and have calibrated your monitor, this section is where you specify the monitor profile created by the profiler. Set the Rendering Intent to Maintain Full Gamut.

If you don't have a calibrated monitor, set the monitor profile to sRGB or AdobeRGB depending on the color space your monitor is set to emulate.

## Proofing and Monitor Curves

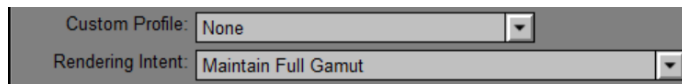
Leave proofing and monitor curves turned off unless you know what you are doing. You can create a lot of havoc if either of these is set up incorrectly.

## Monitor Curves on Startup

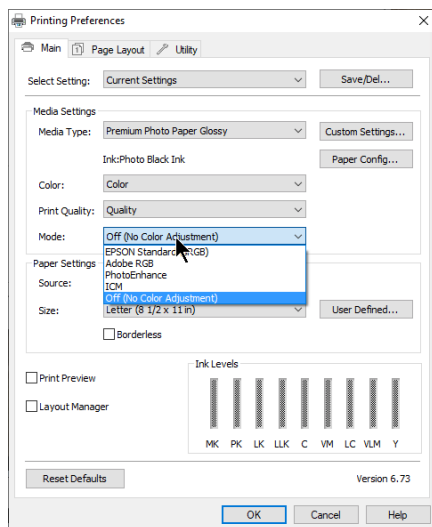
Leave this set to None unless you are using monitor curves in a carefully controlled environment.

## Printing

There are two ways to print using color management. These differ as to how you set the Custom Profile at the bottom of Picture Window's Print dialog box:



And how you configure the printer driver (Epson P800 used as an example)



## Let the printer driver do the work

In this scenario, you set Custom Profile to None and tell the printer driver to handle color management by selecting sRGB, Adobe RGB or ICM, if the image is in sRGB, Adobe RGB or some other color space. This usually works OK if you are using inks and media supported by the printer manufacturer.



### **Use a custom profile**

Use this scenario if you are using non-standard media or inks and you have a custom profile for your printer that was created for the inks and media you are using. Set the Custom Profile to the printer profile and tell the printer driver to print with No Color Adjustment.

Either of these two methods can produce good results, with the custom profile giving a little more control. Don't try to mix and match them however or you may get either no color management or color management applied twice.

When using a custom profile, ideally it should come with instructions as to how to set up the printer driver. For best results, follow these instructions to the letter.

## Clipped Highlights and Shadows

In the course of working with digital images, it is easy to unintentionally lose highlight or shadow detail, making parts of the image solid black or solid white. This is referred to as clipping the shadows or highlights.

Picture Window's clipping alarms can warn you when part of an image has one or more clipped channels (for color images, sometimes just one or two of the RGB channels are clipped).

Clipping alarms are turned on or off via the main tool bar at the top of the main window:



The first button toggles the highlight alarm on or off. When the highlight alarm is on, any part of the current image that exceeds the clipping threshold is displayed in red. Similarly, clipped shadow areas are displayed in yellow when the shadow alarm is on.



Clipping Alarms Off



Clipping Alarms On

Clipping alarm thresholds and colors can be customized in the File/Preferences dialog box.

## Grids

You can superimpose a grid over the current image as a composition guide or to position and align image elements. You can turn grids on or off via the main tool bar at the top of the main window.



Clicking the grid button displays a popup menu of grid options. If you select N x N, an extra control is displayed to let you set the number of grid divisions.



N x N



Diagonal



Golden Mean



Westhoff Diagonal Method





Circular

## Recalculation

Recalculation, or recalc as it is sometimes abbreviated, is the process of making sure all the images in the workspace are up to date. When you create or delete images or modify their transformation settings, it can have an effect on other images. To avoid problems, it is important that all images a given image depends on be recalculated before the image itself is recalculated.

In the simple case, this means that a change to an image causes all the images below it on its branch to be recalculated. However, if an image being recalculated has additional inputs or masks that depend on additional inputs, those inputs must also be recalculated first.

During recalculation, the image currently being recalculated is temporarily highlighted in the image browser with a cyan background to its title bar. This not only gives you a visual cue that recalculation is in progress, but it also lets you watch it ripple through the image tree.

## Circular References

While they rarely arise in normal usage, it is possible to create a workspace that includes one or more circular references. This is a situation where for example image A depends on image B and image B depends on image A, possibly via one or more intermediate images. When this happens, there is no way to recalculate the two images that guarantees a stable result, so all the images in the loop are marked as being part of a circular reference. To let you see that a circular reference has been created, all the images that form part of a circular reference loop are displayed with a red caption bar in the image browser.

To avoid circular references, when you are creating or editing a transformation and try to select another image for use as an input or mask, the menu of available images only includes those that do not depend on the result of the transformation.

In case the term *circular reference* sounds familiar from working with spreadsheets, Picture Window's image tree is very similar to a spreadsheet in which transformations are like formulas. Just like a spreadsheet, when you change an image, all the other images that depend on it are recalculated. The big difference is that a spreadsheet displays rows and columns of data and its dependency tree is hidden from view, while Picture Window displays the data in a dependency tree instead of a grid.

# Keyboard Shortcuts

The following keyboard shortcuts can be used to perform common operations:

<b>F1</b>	<b>Simulates clicking OK on the current transformation dialog box, if any</b>
<b>F2</b>	<b>Simulates clicking Cancel on the current transformation dialog box, if any</b>
<b>F3</b>	<b>Simulates clicking the Add button in the Mask dialog box, if any</b>
<b>F4</b>	<b>Simulates clicking the Subtract button in the Mask dialog box, if any</b>
<b>F5</b>	<b>Simulates selecting Reset from the Settings Menu in the currently open transformation dialog box, if any</b>
<b>Ctrl-B</b>	<b>Cycle the border color among Preferences, Black and White</b>
<b>Ctrl-D</b>	<b>If the workspace is empty, cycle the display among Image Browser Only, Main Image Area Only, and Both. Otherwise, toggle between displaying the Input and Output images for the current transformation.</b>
<b>Ctrl-E</b>	<b>Preview the current image</b>
<b>Ctrl-F</b>	<b>Display the current image full-screen. Press any key or click to cancel</b>
<b>Ctrl-N</b>	<b>File/New</b>
<b>Ctrl-O</b>	<b>File/Open</b>
<b>Ctrl-P</b>	<b>File/Print</b>
<b>Ctrl-R</b>	<b>Reload the last used settings for the currently open transformation dialog box, if any</b> <b>Use Ctrl-Shift-R to reload Clone, Paint, Smudge or Levels and Color tool settings without any of the strokes painted on the image</b>
<b>Ctrl-S</b>	<b>File/Save As</b>
<b>Ctrl-W</b>	<b>Reload the last workspace script, if any – like executing Script/Recover Workspace...</b>
<b>Ctrl-Y</b>	<b>Redo</b>
<b>Ctrl-Z</b>	<b>Undo</b>
<b>↑</b>	<b>Select previous image in branch</b>
<b>↓</b>	<b>Select next image in branch</b>
<b>←</b>	<b>Select previous side branch or the last image in the previous side branch</b>
<b>→</b>	<b>Select next side branch or the last image in the next side branch</b>
<b>Home</b>	<b>Select first image in branch</b>
<b>End</b>	<b>Select last image in branch</b>
<b>Shift ↑</b>	<b>Move current image up one</b>
<b>Shift ↓</b>	<b>Move current image down one</b>
<b>Shift ←</b>	<b>Move current branch left one</b>
<b>Shift →</b>	<b>Move current branch right one</b>
<b>Alt-↑</b>	<b>Scroll the main image area up, if possible</b>
<b>Alt-↓</b>	<b>Scroll the main image area down, if possible</b>
<b>Alt-←</b>	<b>Scroll the main image area left, if possible</b>
<b>Alt-→</b>	<b>Scroll the main image area right, if possible</b>
<b>Num Pad +</b>	<b>Zoom in image or right half of split screen</b>
<b>Num Pad -</b>	<b>Zoom out image or right half of split screen</b>
<b>Num Pad *</b>	<b>Zoom to fit / Zoom to 1:1 image or right half of split screen</b>
<b>Shift Num Pad +</b>	<b>Zoom in left half of split screen</b>
<b>Shift Num Pad -</b>	<b>Zoom out left half of split screen</b>
<b>Shift Num Pad *</b>	<b>Zoom to fit / Zoom to 1:1 left half of split screen</b>
<b>Ins</b>	<b>Add a side-branch</b>

**Space or a Letter**

**Start Quick Pick**

**In the Image Browser:**

**Click**

**Select image and reset destination**

**Right-Click**

**Display context menu**

**Shift Click**

**Copy image to just after the destination**

**Ctrl Click**

**Move image to just after the destination**

**Ctrl-Shift Click**

**Set image as the destination for copy/move**

**In Text Fields:**

**Ctrl-A**

**Select all**

**Ctrl-C**

**Copy**

**Ctrl-X**

**Cut**

**Ctrl-V**

**Paste**

**Del**

**Delete next character**

**Backspace**

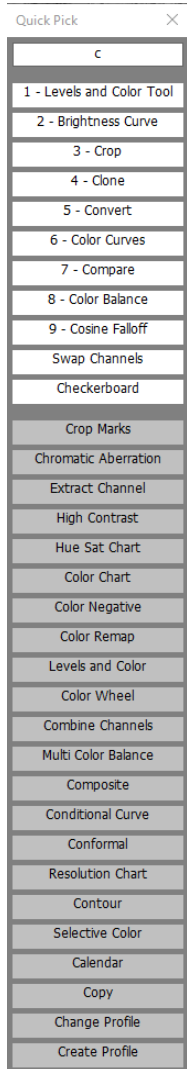
**Delete previous character**



## Quick Pick

Picture Window includes wide range of transformations so finding the one you want in the Transformation menu can mean searching through several submenus. Quick Pick is a shortcut for selecting transformations quickly via the keyboard. It starts when you are at the main screen, and you depress a letter key or the space bar.

If you type a letter, a list of all transformations with names starting with that letter is displayed as one or more columns of buttons. If a transformation name is made up of two or more words, it is included in the list if the letter you type matches the first letter of any of the words.



For example, if you press **c**, you get a list of all the transformations that start with the letter **c** as shown on the left. If you type **space** instead of a letter, you get a list of all transformations.

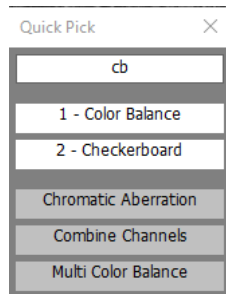
The first group of transformations includes ones you have used before, listed in order of frequency of use. The first nine of these are numbered -- to select one of these, just type its number (1 .. 9). The transformations at the bottom are listed in alphabetical order.

You can click any of the buttons to close Quick Pick and start the corresponding transformation or you can type more letters to narrow the selection.

*The names of the tools and transformations are the names displayed as captions in the image browser -- in a few cases, these are shortened versions of the names displayed in the Transformation menu. Matching is case-insensitive, so, for example, **a** matches either **a** or **A**.*

As you type more letters, only buttons that contain the letters you type somewhere in the name are kept. If you get to the point where the entered name is an exact match for a button or only one name matches, Quick Pick closes and the corresponding transformation is started. If no names match the letters you entered, the last letter you entered is ignored.

For example, if you type **cb** the display changes to:



This is the list of transformations that start with **c** and also contain an **b** somewhere in the name. If you then type **a**, only **Color Balance** matches since it is the only button starting with **c** that also has **ba** in its name (the others have some other letter following the **b**), so Quick Pick launches the **Color Balance** transformation. If you type **cbo** instead of **cba**, the only match is **Checkerboard**.

Typing **Esc** or **Enter** closes Quick Pick.

# The Transformation Menu

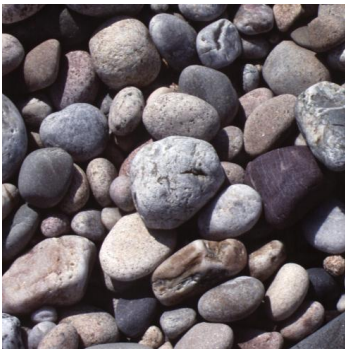
Blur  
Color  
File  
Geometry  
Gradient  
Gray  
Sharpen  
Special Effects  
Test Patterns  
Tool  
Blend...  
Bypass...  
Compare...  
Composite...  
Convert..  
Copy..  
Filter...  
Frame...  
Masks...  
Stack Images...  
Text...  
Transparent PNG...  
Watermark...

This section provides a complete catalog of Picture Window's transformations in the order they appear in the Transformation menu, including an example or two showing what they do. For details on individual transformations, see the help file or the transformation reference manual: Transformations.pdf.

## Transformation/Blur

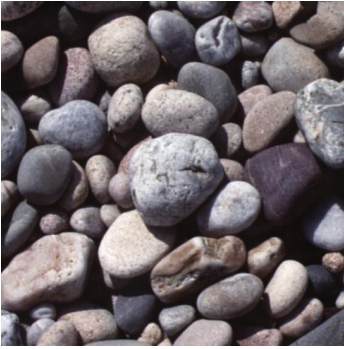
### How Blurring Works

An image is blurred by replacing each pixel with a weighted average of the pixels near it. The larger the blurring radius, the more surrounding pixels are averaged and the softer the image gets.



Original

**Blur/Blur More** – Quick, light blurring.



Blur



Blur More

**Gaussian** – Fast, heavy blurring of an entire image.



Gaussian Blur

**Precise Gaussian** – A slower, more accurate version of Gaussian blur with superior halo reduction and more control over blurring with masks.



Original Image



Background Blurred with Gaussian



Background Blurred with Precise Gaussian

**Linear** – Simulates motion blur with the camera moving in one direction.



Linear Blur

**Motion** – Simulates motion blur with the camera moving on a prescribed path.



Motion Blur

**Spin** – Simulates blur by rotating the image



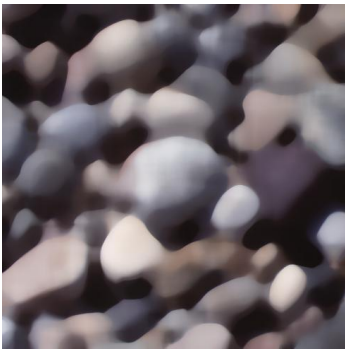
Zoom Blur

**Zoom** – Simulates blur by zooming the image



Zoom Blur

**Median** – Good for removing speckle noise or producing painterly effects



Median Blur



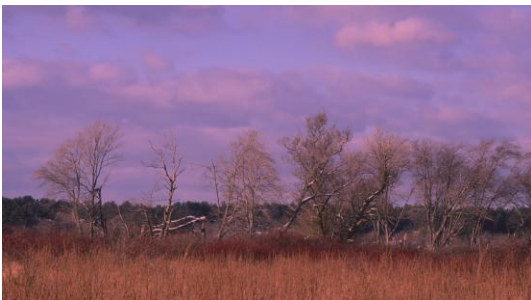
## Transformation/Color

The Color transformation group includes transformations that are primarily intended to be used on color images. While they can be applied to black and white images as well, in most cases this does not produce a useful result.

**Chromatic Aberration** – remove color fringes from lateral chromatic aberration

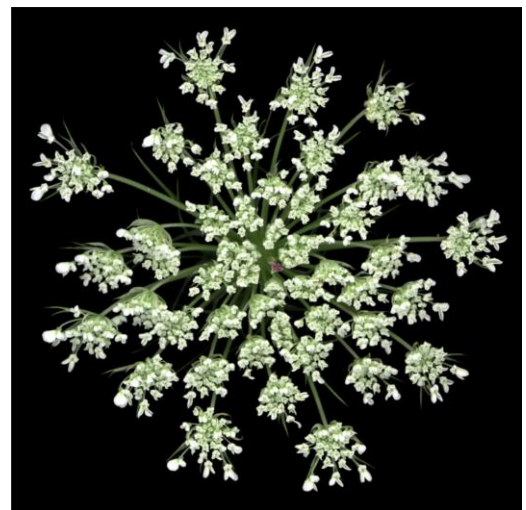
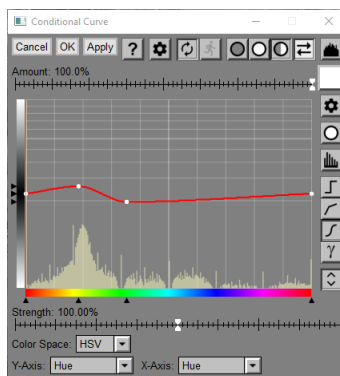


**Color Balance** – add or remove color casts



You can use the Color Balance transformation to add a color cast or to remove a color cast. A more powerful version of this transformation called Multi Color Balance is also available (see below).

**Conditional Curve** – adjust one channel based on another



Original

Conditional Curve

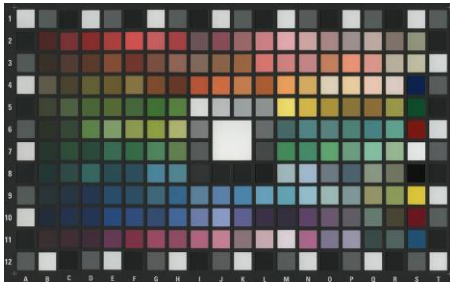
Result

In the example above, a conditional curve is used to make a subtle hue shift for a certain range of hues. It can also work on saturation or brightness, letting you increase or decrease any channel based on the value of any other channel.

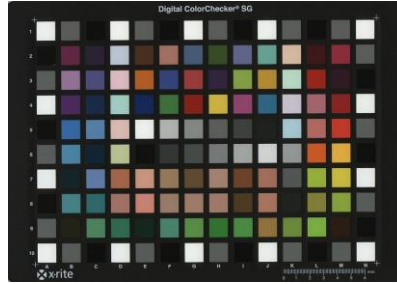
**Create Profile** – create custom profiles

You can use the Create Profile transformation to create custom profiles for scanners or digital cameras. This is primarily useful for studio work where the lighting is consistent, for copying artwork, or for photographing objects in the field under varying lighting conditions.

To create a profile, you need to start by photographing a standard target under the lighting conditions you want to correct for. Picture Window supports the following targets:



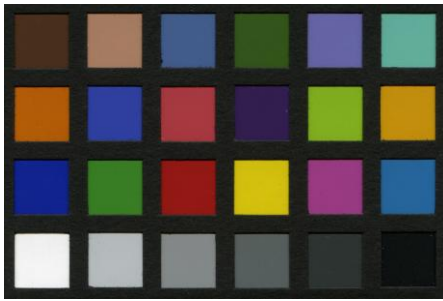
ColorChecker DC



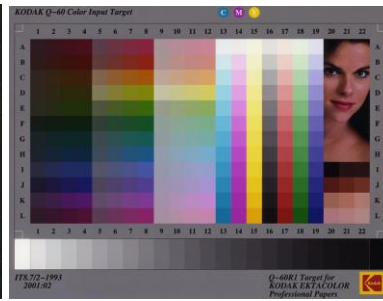
ColorChecker SG



HCT



ColorChecker



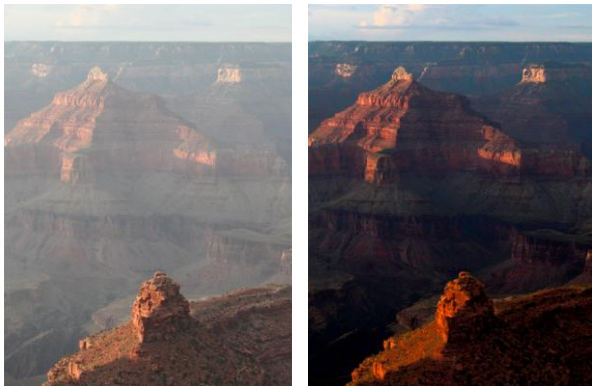
IT8

The Create Profile transformation uses the reference image of the target to construct an ICC color profile that, when applied to the reference image, converts it to the way it looks under standard lighting conditions. This profile can then be used to correct other images taken under the same lighting conditions.

**Curves** – apply a curve to each color channel

The Color Curves transformation is like the Brightness Curve transformation, but it also lets you apply curves to the hue and saturation of an image as well as its brightness.

**Dehaze** – reduce atmospheric haze in an image



**Extract Channel** – extract one color channel as a black and white image

The Extract Channel transformation lets you extract one channel of a color image as a black and white image. You can extract luminance, red, green, blue, or hue, saturation, or brightness in the HSV or HSL color space.

**Hue Saturation** – selectively change saturation, brightness and hue.

This transformation displays a 2-dimensional hue-saturation histogram of the input image and lets you select parts of the histogram. Once selected, you can adjust the saturation, brightness or hue of the corresponding colors in the input image.



## Match Reference

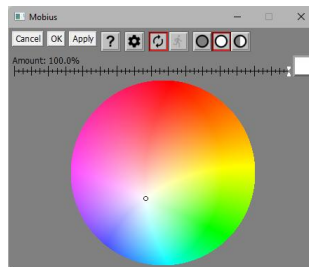


ColorChecker

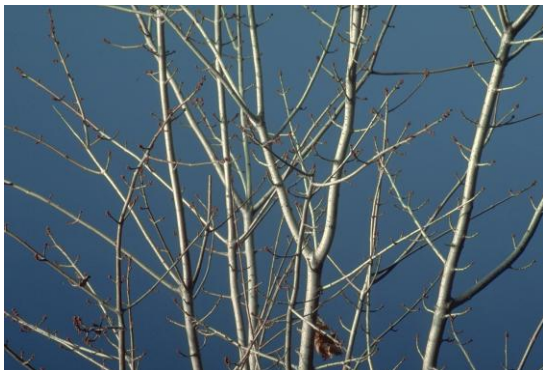
Imagine you are on a field trip photographing objects for a museum catalog under varying lighting conditions, and you want the colors of all the objects to be consistent. If you bring along a portable ColorChecker and photograph it under the same conditions as each object, then when you get home, you can use these reference images to correct all the object photos to standard lighting conditions.

For an even more precise solution to this problem, you could photograph a more extensive reference target and create a custom profile for each image using the Create Profile transformation (see above).

## Mobius – emphasize one color while reducing others



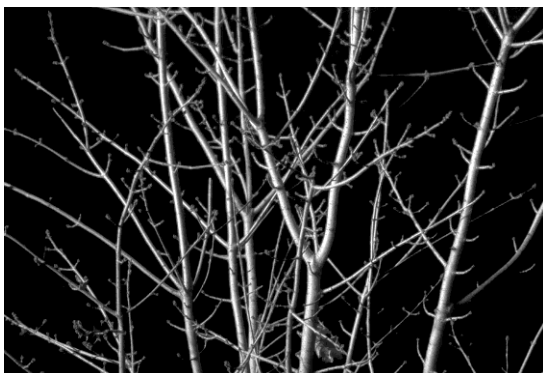
## Monochrome – convert color images to black and white



Original



Luminance



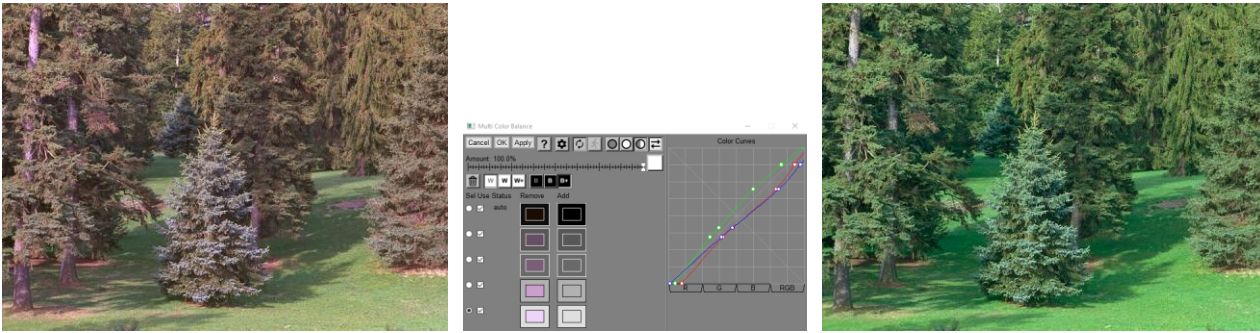
Sky Darkened



Tinted

The Monochrome transformation lets you convert color images to black and white using various methods. The resulting black and white image can also be textured (for example to look like film grain) or tinted.

**Multi Color Balance** – add or remove color casts for different brightness levels



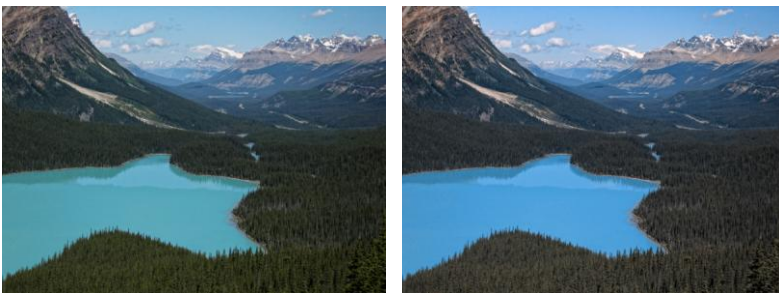
Some images have different color casts in the shadows, mid-tones and highlights. Using Multi Color Balance you can correct these problematic images with great precision.

**Negative** – convert scanned color negatives to positives



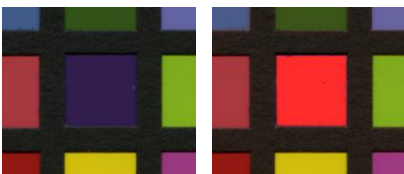
You can use the Color Negative transformation to convert scanned images of color negative film to positives.

**Primaries** – adjusts the RGB primary colors for an image



**Remap** – selectively remap one or more colors

The Remap transformation lets to change one or more colors without affecting other colors in the image.



Unlike the Selective Correction transformation which matches colors only on hue and saturation, Remap just changes colors that match exactly.

**Replace Channel** – replace one channel of a color image with a black and white image of the same size.

The Replace Channel transformation facilitates applying one or more transformations to one channel of a color image without affecting its other channels.



## Remove Purple Fringe



Some combinations of digital camera bodies and lenses give rise to purple fringing especially at edges between bright and dark parts of the image. You can use the Remove Purple Fringe transformation to reduce or eliminate this artifact.

## Saturation – increase or decrease saturation



By using a mask with the Saturation transformation, you can decrease the saturation of an image in some areas and increase it in others.

## Selective Correction – selective color correction by hue and saturation



The Selective Correction transformation lets you change some colors in an image (such as the scarf above) while leaving others unchanged. You can make multiple corrections at once and alter not just the hue and saturation but also the brightness for each color. This feature is also built into the Adjust transformation.

## Swap Channels – swap two color channels



Swapping the red and blue channels is often used as a starting point for restoring blue skies in infrared images.

## Transformation/File

The File transformations are used during batch processing to apply a series of operations to a list of input files.

### **Export** – resize and save images to a folder

The Export transformation (there is also a related File/Export command) exports its input image to a folder, optionally resizing it, converting it to a standard profile such as sRGB, and saving it as a specific type of file. This is useful when exporting images to email or post on the web.

### **Print** – print images

The Print transformation (this is also a related File/Print command) prints its input image. Each image is printed on a separate page.

### **Slide Show** – add images to a slide show

The Slide Show transformation converts its input image for viewing as part of a full-screen slide show and adds it to the current slide show file list. When the batch process completes, the slide show is displayed.

## Transformation/Geometry

**Add Border** – add a border around the edge of an image



You can fill the border with either a solid color or with a seamless image tile repeated as necessary to fill the background. You can select different border shapes including some that have rounded corners with adjustable radius. You can also adjust the softness of the edge between the image and the border. This transformation is also useful if you need to add room to an image for a signature or caption, or if you want to composite another image next to it.

**Crop** – crop an image



You can crop an image to fixed or unconstrained proportions and the crop box can also be rotated if you wish. You can also resize the image after cropping it.

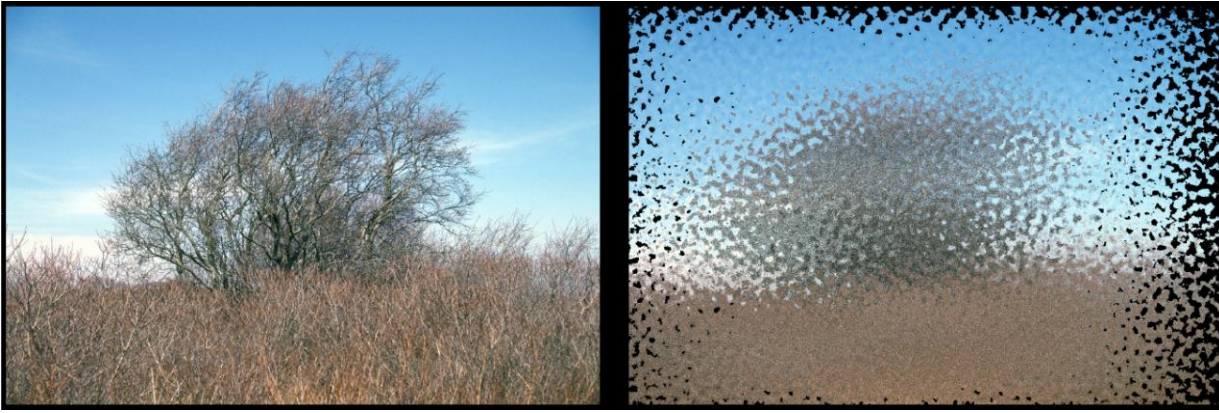
**Crop Marks** – add a border and crop marks to an image



Crop marks are guides for accurately trimming printed images. You can control the size, line width and setback of the crop marks as well as the border color.



**Displace** – shift or rotate an image



This transformation can produce interesting results if you use masks to vary the displacement offsets.

**Distort** – stretch an image as though it was on a rubber sheet



**Lens Distortion** – correct or add lens distortion



This transformation lets you accurately correct most common barrel and pincushion distortions, even for fisheye lenses.



**Layout** – arrange images and text on a background



**Level** – make an image horizontal or vertical



You can quickly level horizons or make buildings vertical using the Level transformation.

**Resize** – change physical dimensions of an image or its size in pixels

The Resize transformation lets you change the physical dimensions of an image and/or change its width and height in pixels. This is useful when you want to prepare an image for printing at a specific size or if you need to reduce an image to send it as an email attachment or post it on the web.

## Rotate-Mirror – rotate and reflect an image

This transformation lets you select from the eight possible ways an image can be reflected or rotated by 90°.



## Stereo – process stereo image pairs into an anaglyph or prepare them for side-by-side viewing

The Stereo transformation lets you start with a pair of stereo images, align them, and create red/cyan anaglyphs, full color anaglyphs, or prepare the images for side-by-side viewing.



Left



Right



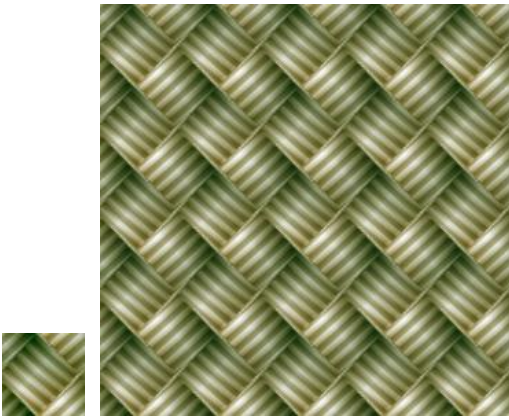
Full Color Anaglyph



Side-by-Side



**Tile** – replicate an image horizontally or vertically



The Tile transformation repeats an image multiple times vertically and/or horizontally, with or without mirroring. This works best with seamless tile images whose top and bottom edges and left and right edges match.

**Warp** – crop, rotate, shear or perspective correct an image

The Warp transformation can be used to straighten converging verticals for architectural photography, rotate images, or intentionally stretch or distort images.

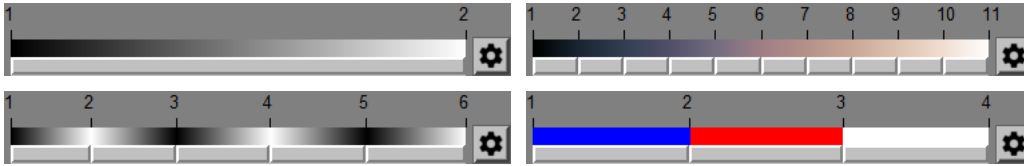


# Transformation/Gradient

Gradients are images that transition through a range of colors. Gradients can be created as color filters or applied to their input image.

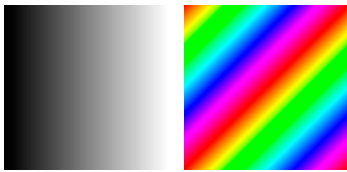
## Color Lines

A color sequence and transitions between colors are defined by a color line control. Gradients can be as simple as a uniform transition between two colors or a complicated sequence.



Color lines are also used when tinting black and white images.

## Linear



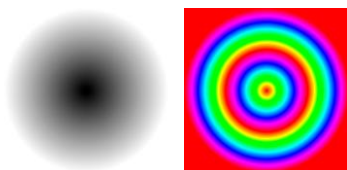
Linear gradients vary horizontally, vertically or at some angle. They can be used like graduated neutral density filters to lighten or darken parts of an image.

## Multipoint



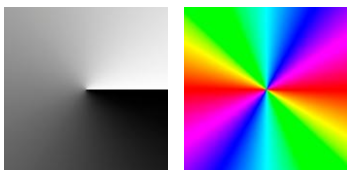
Multipoint gradients are defined by control points located in the image. Each control point has its own color, and the space between control points is interpolated from the nearby points.

## Oval



Oval gradients vary in circles or ellipses. You can use oval gradients to highlight part of an image or to create a vignette by darkening the corners of an image.

## Sweep



Sweep gradients vary according to the angle about a central point.

## Transformation/Gray

The Gray transformation submenu includes transformations that work for both black and white and color images.

**Add Texture** – apply texture to an image



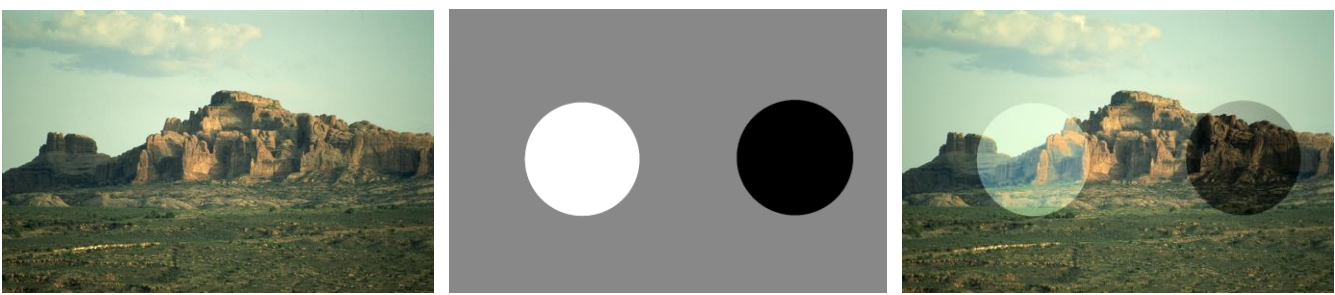
**Adjust** – adjust brightness, color and sharpness of an image



**Autorange** – adjust image to use full dynamic range



**Brightness** – lighten or darken an image



image

mask

result

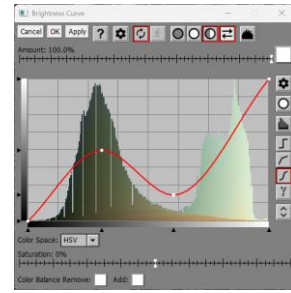
Using the Brightness transformation with a mask you can simultaneously lighten some parts of an image and darken others.



**Brightness Curve** – apply a brightness curve to an image



image



curve



result

**Combine Channels** – create a color image from three black and white images



red



green



blue



combined

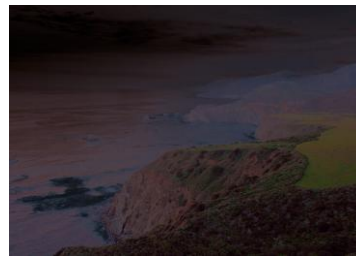
**Difference** – subtract one image from another



a



b



b - a

**Denoise** – noise reduction

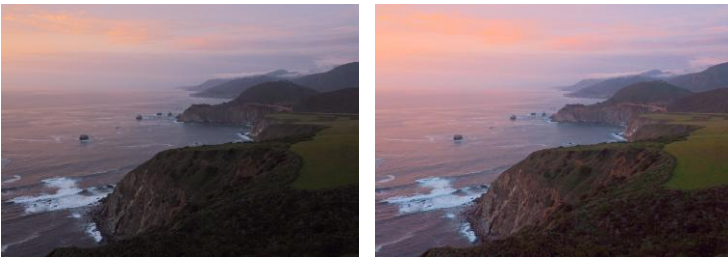


Noise Reduction

**Equalize** – change the brightness of an image so it has a specified histogram

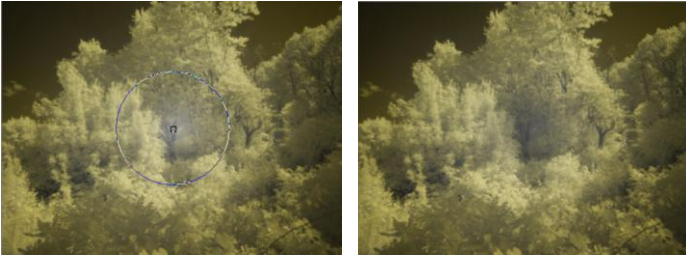


**Gamma Adjust** – adjust image gamma

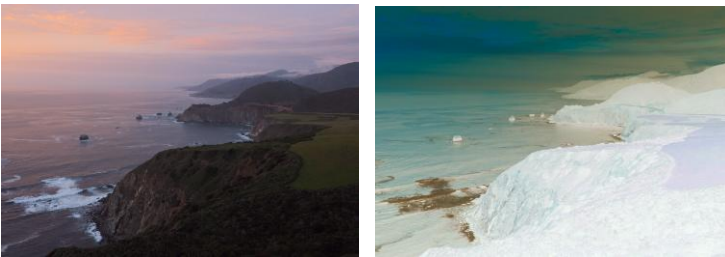


Changing the gamma of an image is a way to adjust its brightness. Much of the effect is concentrated in the shadow areas.

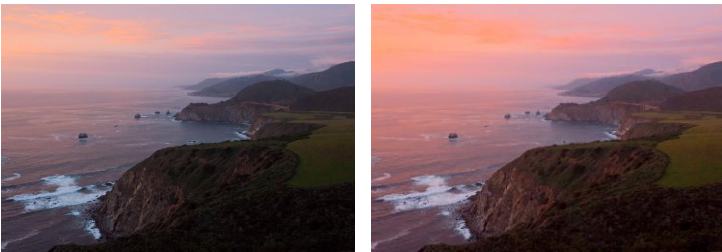
**Hotspot** – compensates for the central hotspot in some infrared photographs



**Invert** – make a negative image

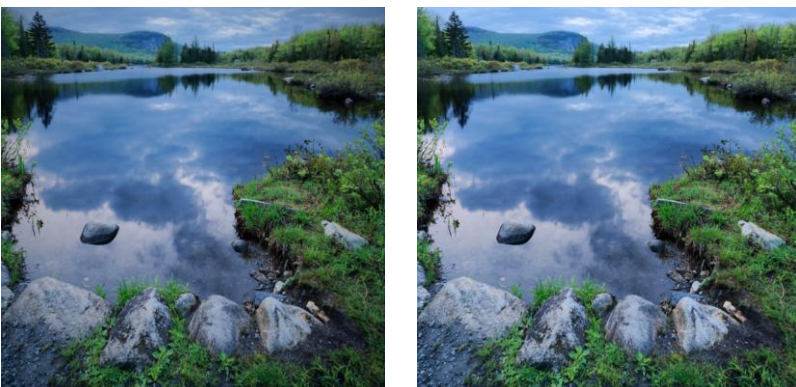


**Levels and Color** – adjust brightness, contrast and color balance



Levels and Color is a simplified version of the Adjust transformation.

**Light Falloff** – compensates for light falloff in the corners of an image or other radial variations in brightness

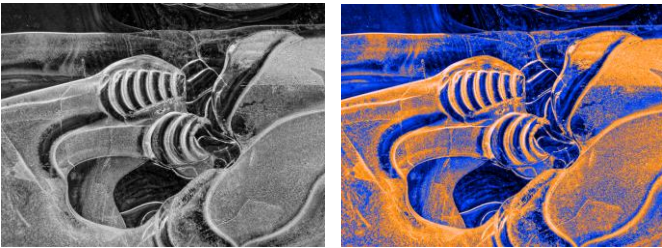




**Three-Zone Adjustment** – adjust brightness, contrast and saturation for three selected brightness zones



**Tint** – colorize a black and white image



The Tint transformation lets you assign different colors to different gray levels in the input image.

**Two-Zone Adjustment** – adjust brightness, contrast and saturation for two selected brightness zones

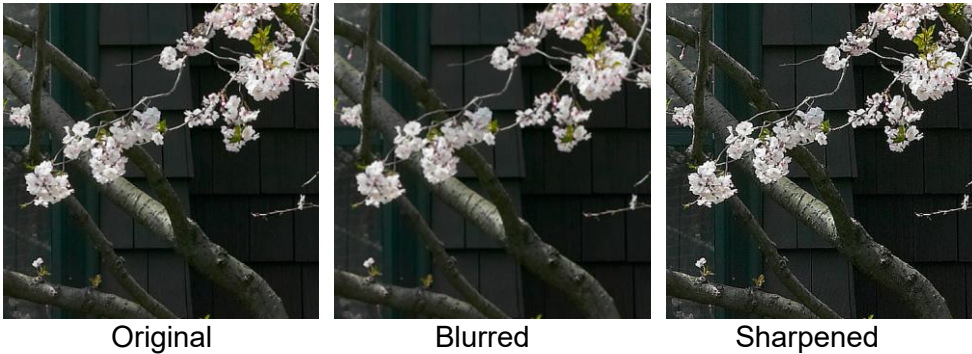


# Transformation/Sharpen

## How Sharpening Works

Sharpening is one of the most impressive transformations you can apply to an image since it seems to bring out image detail that was not there before. What it does, however, is to emphasize edges in the image, making them easier for the eye to pick out—while the visual effect is to make the image seem sharper, no new image detail is actually created.

Paradoxically, the first step in sharpening an image is to blur it. Next, the original image and the blurred version are compared a pixel at a time. If a pixel is brighter than the blurred version it is lightened further; if a pixel is darker than the blurred version, it is darkened. The result is to increase the contrast between each pixel and its neighbors. The nature of the sharpening is influenced by the blurring method used and the extent to which the differences between each pixel and its neighbor are exaggerated.



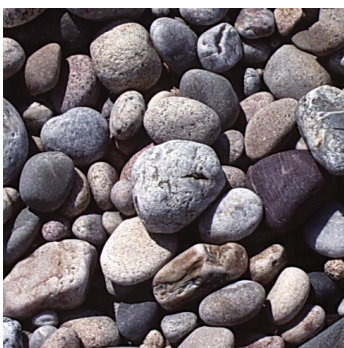
## Over-sharpening

As you continue to sharpen an image, edges become unnaturally pronounced—dark objects are outlined with light halos and light objects are outlined with dark halos. Also, normally invisible noise in the image is amplified and starts to show up as texture in areas that looked smooth in the original image. This can create an undesirable graininess in parts of photographs that should be smooth such as clouds and clear skies.

As you progressively sharpen a slightly blurry image, it first starts to look better, but then as you begin to over-sharpen, it starts to look worse again. Once you know what over-sharpening looks like, you will be able to spot it on the screen and back off a little.



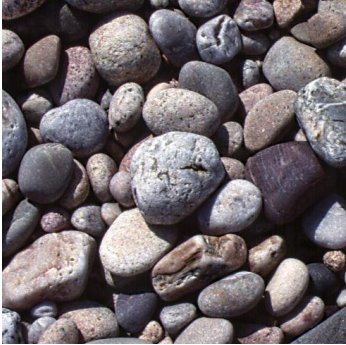
## Sharpen / Sharpen More – Fast, light sharpening tool



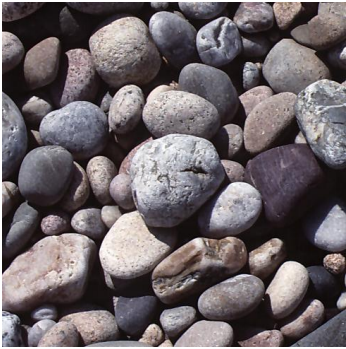
**Unsharp Mask** – Fast, basic sharpening tool



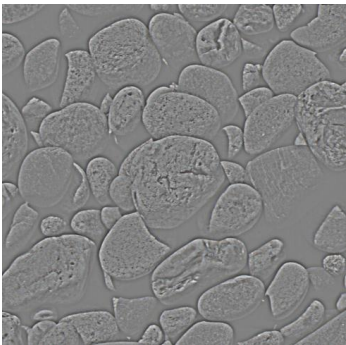
**Multipass Sharpen** – Superior halo reduction and multi-scale sharpening



**Advanced Sharpen** – Combined noise reduction, speck removal and sharpening



**High Pass** – Extract detail information from an image.



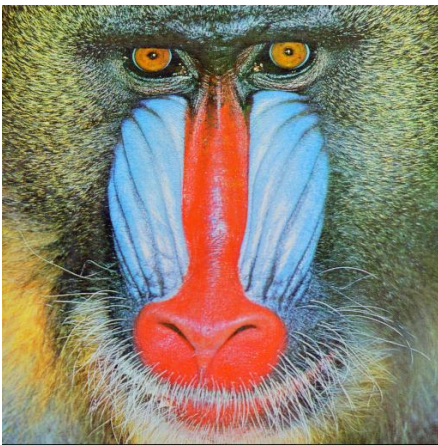


## Transformation/Special Effects

**Calendar** – superimpose a calendar on an image



**Conformal Mapping** – distort images using functions of a complex variable



**Contour** – draw contour lines over an image at selectable brightness levels



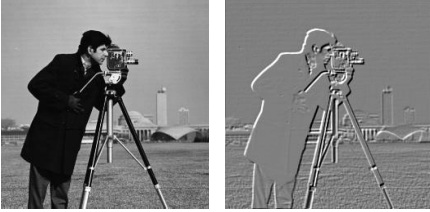
**Drop Shadow** – add a drop shadow to an image



**Edge** – locate, lighten or darken edges



**Emboss** – render an image as embossed



**Fan** – distort an image into the shape of a fan



**Grid** – superimpose a grid over an image



**Halftone** – render an image as a halftone





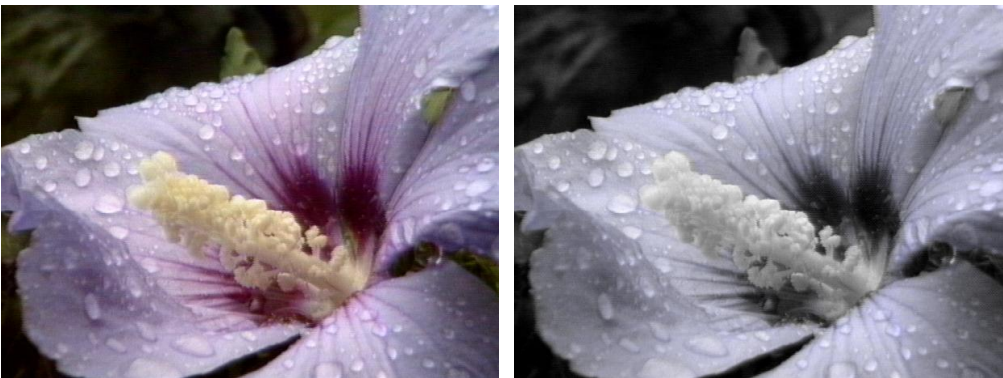
**High Contrast** – render an image in pure black and pure white



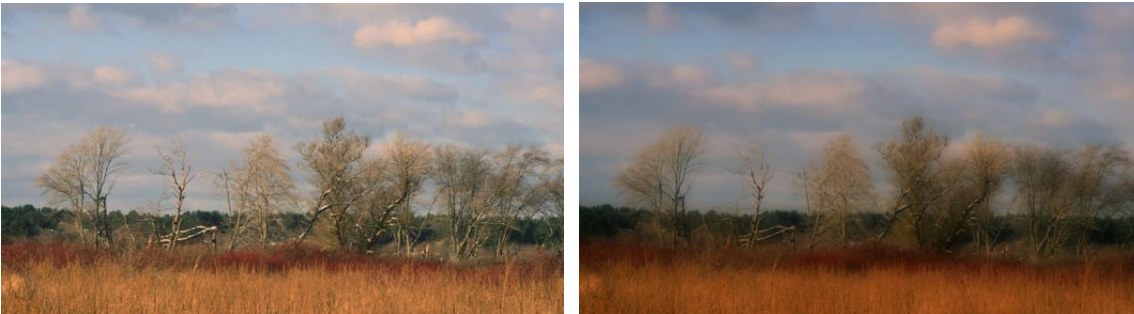
**Kaleidoscope** – simulate viewing an image through a kaleidoscope



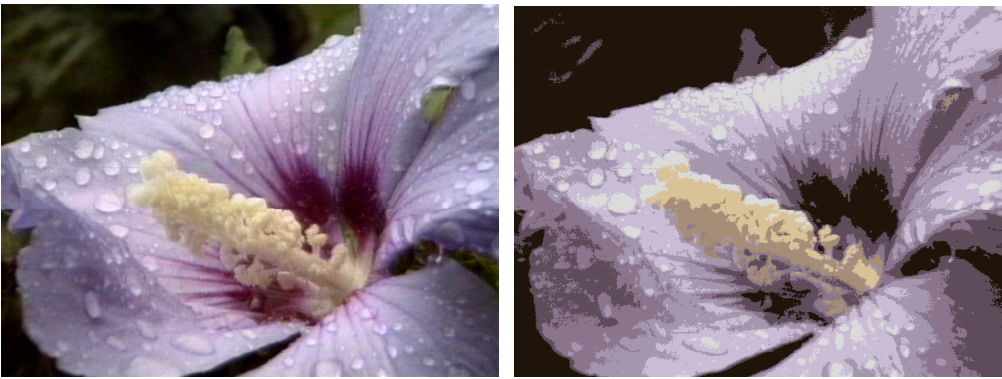
**Monocolor** – render an image using just one color



**Orton Effect** – combine an image with a blurred version of itself



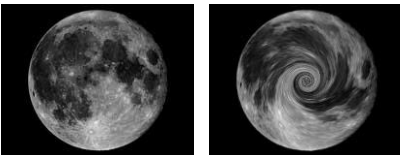
**Posterize** – render an image using a limited palette



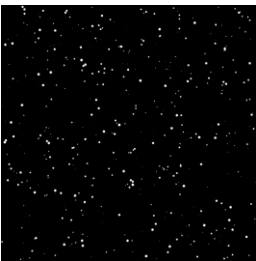
**Repeat** – place multiple copies of up to four different images on a background in different sizes and orientations



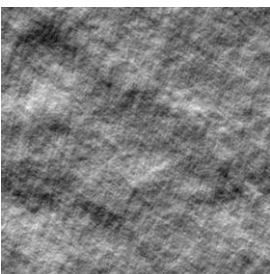
**Spiral** – distort an image into a spiral



**Starfield** – apply a random, simulated starfield to an image

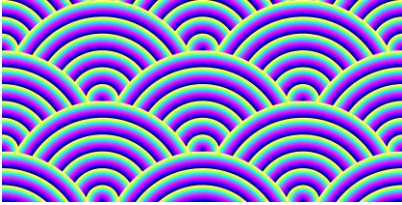


**Texture** – create a random texture





**Wave** – create Japanese overlapping wave (seigaiha) patterns



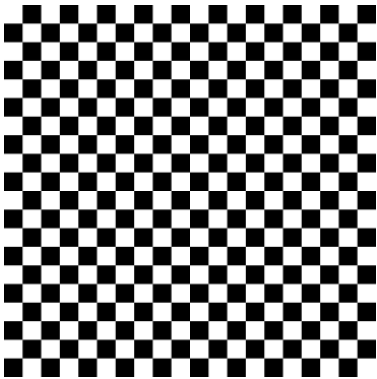
**Watercolor** – render an image like a watercolor



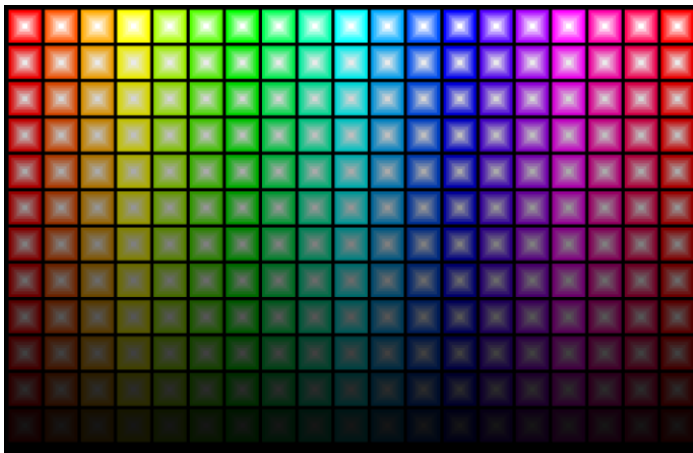
## Transformation/Test Patterns

Picture Window can generate a variety of test patterns useful for evaluating monitors and printers, calibrating workflows, or visualizing how a series of operations affect different colors.

### Checkerboard



### Color Chart



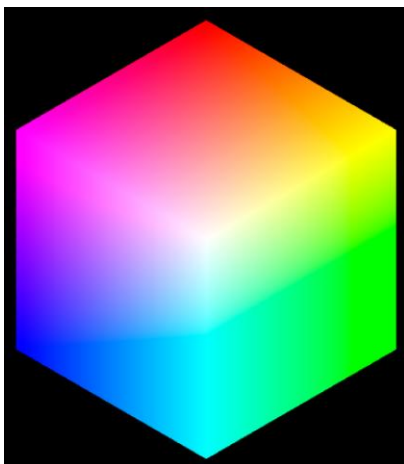
Hue varies by column, brightness by row and saturation within each cell.

### Color Spin

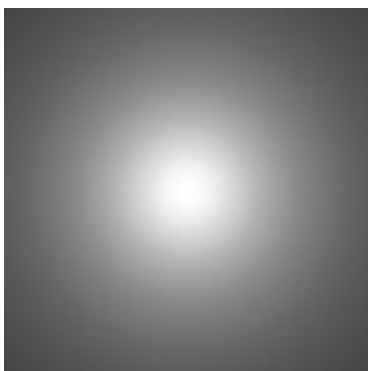


This pattern tests if color management is being applied.

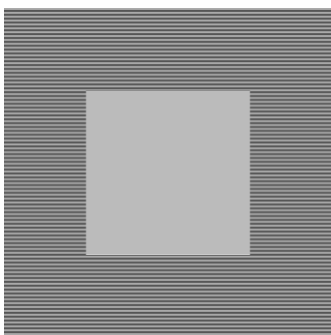
### Color Wheel



## Cosine Falloff

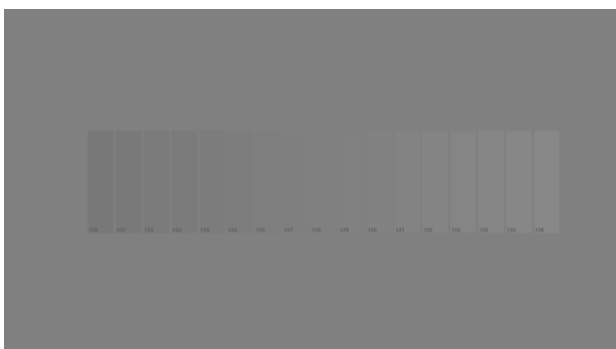


## Gamma Test



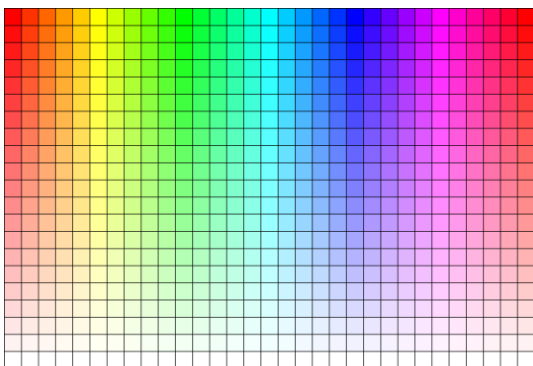
Lets you check your monitor gamma.

## Gray Discrimination Test



Lets you check that all gray levels are distinguishable.

## Hue Saturation Chart

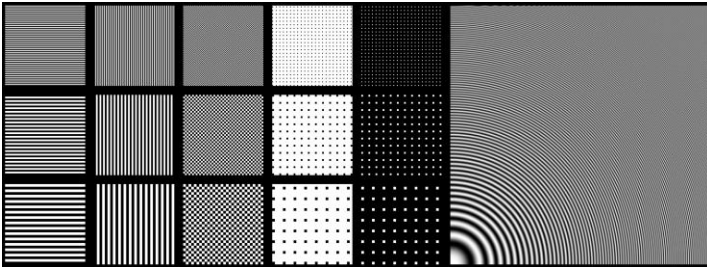


## Q-13



A simulated Kodak Q-13 target made up of 20 graduated gray patches with equal steps in density.

## Resolution Chart



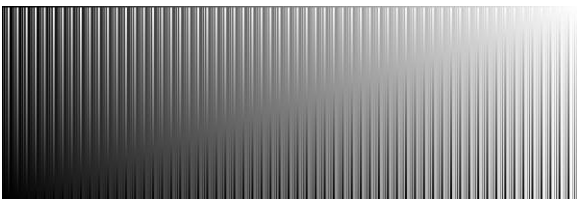
Useful for testing printers and monitors.

## RGB Cube



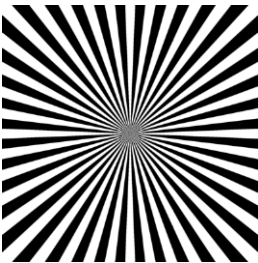
Used to create .cube color lookup files.

## Sharpen Test



Useful for seeing the effects of sharpening settings.

## Star



Creates a Siemens Star test chart.

## Step Wedge



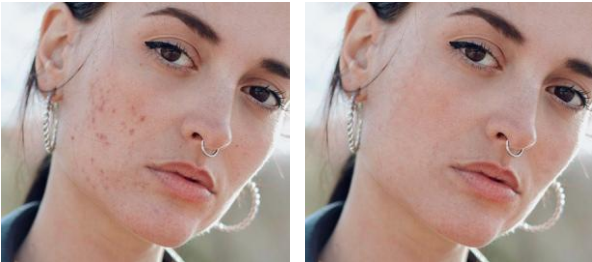
Step wedges are used to calibrate black and white workflows by printing the test pattern and measuring each patch with a densitometer.

## Transformation/Tool

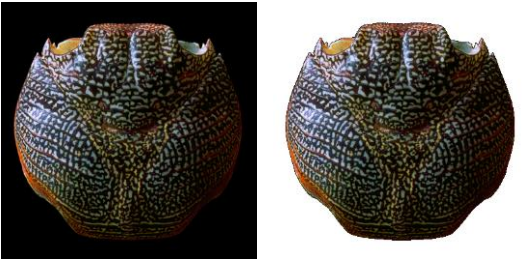
**Clone** – retouch an image by painting one part of it over another image or over the same image



**Detail** – paint texture from one part of an image to another



**Fill** – paint over a region of similar colors with a solid color



**Levels and Color** – make changes to brightness and color by painting with a brush.





**Lines, Arrows, Text** – draw lines or arrows on an image and lets you place text boxes.



**Paint** – paint directly on an image with a solid color



**Redeye Removal** – remove redeye from a portrait



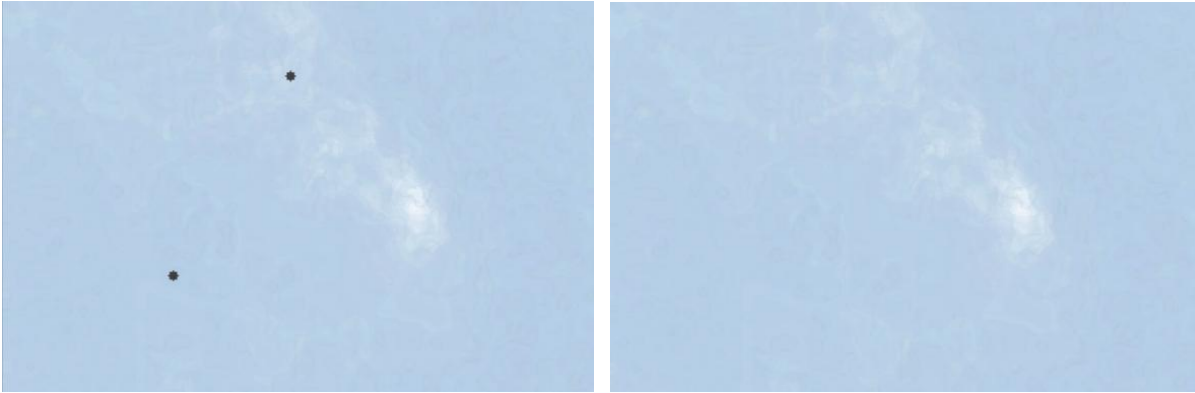
**Scratch Removal** – remove scratches, power lines or other linear artifacts from an image



**Smudge** – smear an image



**Speck Removal** – remove dust specks or other small image defects





## Other Transformations

**Blend** – combine two images.

The Blend transformation lets you combine two images of the same size in a variety of ways. It is basically a simplified version of the Composite transformation.

**Bypass** – copy input image to output

This transformation can be used as a placeholder in a workflow.

**Change Profile** – convert an image to a different color space

The Change Profile transformation lets you assign a new profile to an image or convert images from one color space to another.

**Compare** – compare two images

Using the Compare transformation, you can check for differences between two images using various methods: moving curtain, viewing side-by-side, displaying the difference image or blinking between the two images.

**Composite** – combine elements from two images



You can use Composite to combine images using different blending modes and using masks to define how much of each image appears in the result. Finally, you can also align the overlay image with the base image in different ways to control its location, orientation and perspective.

**Convert** – convert an image from one type to another

Picture Window supports 1-bit binary images, 8- or 16-bit black and white images and 8- or 16-bit color images. Using the Convert transformation, you can convert images from any of these types to any other type.

**Copy** – copy an input image to the output image

The copy transformation starts a new top-level image that is a copy of its input. If other transformations use the copy as an input, then if you edit the Copy transformation, you can redirect the input to a different image.

**Filter** – apply a solid color or filter image to an image

The filter can be a solid color which is like photographing a scene with a color filter. Or, the filter can be an image, in which case the result is like sandwiching two pieces of film and viewing them on a light table.



Original



Solid Color Filter



Filtered by a Gradient

**Frame** – preview what an image will look like matted and framed against a wall color and with specific lighting



**Masks** – create up to four masks for an image

This transformation is available as a convenience when you need to make several different masks for the same image.

**Stack Images** – combine multiple images with adjustable weights

You can use Stack Images to blend multiple images with equal or with different weights, a technique sometimes used to reduce image noise or to simulate multiple exposures.

Once calibrated, you can also use it to combine over- and under-exposed images of the same subject to produce a wider dynamic range.

**Text** – draw text over an image



**Transparent PNG** – create a transparent PNG file for the web



**Watermark** – apply a watermark or logo to an image

